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MONITORING TIMES

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- **Classification Codes**
by Menlo DuPem
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SIGNING ON: *Christian Science Monitor Electrifies the Airwaves*

Going for Number 1—WCSN

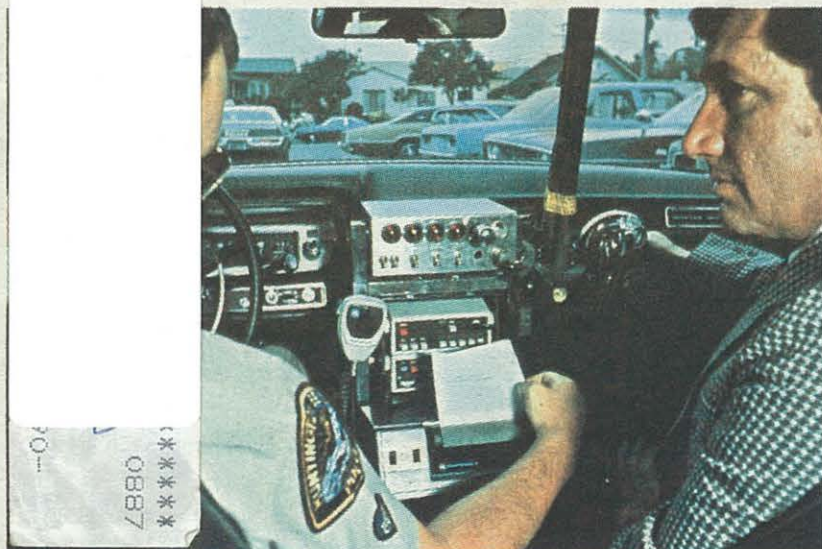
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"First the blade, then the ear,



then the full grain in the ear"®

An Introduction Surveillance



The High-Tech Eyes And Ears of the Law

By Jerry Cody

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MT REVIEWS:

The Two Newest Additions



Top: Kenwood's new R-5000 High Performance Receiver. Bottom: Radio Shack's new Pro-2004 Programmable Scanner. Products reviewed by Larry Magne and Bob Parnass, respectively.

We've Got It All!



New!

International Radio: Limits of the Limitless Medium by Dr. Donald Browne

Browne is one of the leading scholars in the field of international radio and this is one of the most serious, thorough and comprehensive studies of international radio written in recent years. And despite its frankly intimidating price, we cannot recommend this book strongly enough. If you really want to learn about international radio -- its background, history, politics, programming and more -- treat yourself to this book. It's almost like becoming an instant expert. Hardback only. [#IRLLM] \$36.90

1987 World Radio TV Handbook

It's here and in stock! And it's not getting older, it's getting better! The 41st annual edition of this authoritative directory of world radio and TV continues the proud tradition of previous years. Over 600 pages of station names, addresses, broadcast schedules, languages, and other information -- even down to phone numbers! No wonder it's called the "bible" of international radio. Their price: \$19.95 plus shipping and handling. Our price: \$17.95 -- and shipping is free! [#WRTVH]

Shortwave Radio Listening with the Experts Various Authors

A shortwave book that takes you from A to Z. A massive, 500+ page book filled with 25 chapters of information on virtually all aspects of radio monitoring -- from "How to Get Started" to antennas, DXing and much, much more by some of the biggest names in the business: Magne, Jensen, Helms, Berg, and others. It's the definitive book on the radio hobby. No SWL should be without this valuable, informative, new shortwave book. Their price: \$21.95 plus shipping and handling. Our price: \$19.95 and shipping is free! One of our best-sellers! [#SWEXP]

1987 Radio Database International Magne & Jones, Editors

If you enjoy scanning the shortwave broadcast bands and you buy only one book this year, get RDI. RDI will undoubtedly be the most used book in your library. It's the ultimate frequency guide to the shortwave bands. Arranged by frequency, Radio Database International's computer-generated graphics take you through the broadcast bands from Radio Republik Indonesia on 2260 kHz on up through Belgian Radio on 21810 kHz. It's high accuracy and reliability made it the smash hit of 1986. And RDI now includes reviews of the latest shortwave receivers by award-winning author Larry Magne plus other articles of interest. Thousands sold already in 1987 and it's only been out a few months! Our best selling book. 352 pp. [#RADAI] \$12.95

Havana Moon Is Back!

Unos Dos Cuatros: The Story of the Number's Stations by Havana Moon

Popular former MT columnist Havana Moon is back with a full length book on those mysterious numbers stations! Numbers stations-- some have said that they're transmission used by spies. Others have associated them with everything from the military to UFOs! They've been around for years and still no one knows exactly what they're on the air for. But if there's one man who can shed some light on the topic, it's the equally mysterious Havana Moon. [#UNDOQ] \$13.95

The Shortwave Listener's Antenna Handbook by Robert Traister

Even the most sophisticated receiver can pick up only hum-drum signals if the antenna isn't up to par. And a relatively inexpensive receiver can bring in some pretty impressive signals when the right antenna is in place. A complete, authoritative guide to shortwave listening antennas including how to design, build and install them. [#SWANH] \$9.95.

The Shortwave Listener's Handbook by Harry Helms

Harry Helms is a name known to readers of Popular Communications and dozens of other radio magazines down through the years. And now he has a major new book covering the entire field of shortwave listening. Covers the subject from A-Z. \$14.95

New!

Clandestine Radio Broadcasting by Larry Soley and John Nichols

Years in the making, it's finally here. An incredibly thorough, comprehensive look at clandestine radio broadcasting by renowned experts Larry Soley and John Nichols. If you enjoy clandestine radio -- and believe me, if you spend \$47.95 for a book on the subject you better damn well enjoy it -- this is truly an excellent, hardcover book. This is it. [#CLRAB]

The Basic Electronics Course by Norman Crowhurst

Whether you've simply got a mild interest in electronics or would really like to become better versed in the technical aspects of radio, the "Basic Electronic Course" is for you. Written in an easy-to-follow fashion, author Crowhurst presents the basic elements of electronics in the most logical sequence possible, bringing you a clearer understanding of the subject. A complete and thoroughly accurate self-study text for everyone. [#BAELC] \$13.95

Other books:

New!

Language Lab Available for French or Spanish. French. An ingenious book that gives you hundreds of key phrases needed for filling out attention-getting reception report forms -- and their French equivalent. Now you can increase your chances for that sought-after QSL with a first-class report in the station's own language. French [#FRLAL] \$12.95 or Spanish [#SPLAL] \$12.95.

Fine Print: All prices include shipping. Most items shipped same day if you use Telecheck (see order form). All books are paperbacks unless otherwise noted. Prices in this advertisement supersede those in all other advertisements. Prices subject to change without notice. Items not returnable except in cases of damage which must be reported to and documented by the shipping agent at time of receipt. Heretofore. Wherein. Parties of the third part. Blah, blah, blah...

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The Selling of the Spectrum

In the eternal quest for additional revenue during an era of unprecedented deficit spending, the Reagan administration has proposed auctioning off various classes of licenses and frequencies to the highest bidder. Even the prestigious *New York Times* has given its editorial approval to the money-making scheme.

An anticipated \$600 million would be brought in from paging, cellular telephone and TV station applications next year if the proposition gets the nod on Capitol Hill, and the problem of who gets what would be solved.

Unfortunately, the answer to "Who gets what?" is quite clear: The telecommunications monopolies. AT&T, forced to divestiture just a short time ago for antitrust violations, becomes a sure winner; you and I, with limited ability to buy legislative interest, are the losers.

True, in the past it has been a common practice for investors to apply for licenses in coveted portions of the spectrum and then sell them for a profit, but this is a result of inadequate regulation. The small businessman who needs a license should not be penalized for the short-sightedness of existing legislation.

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Thank You

In the frantic routine of a publishing day it is hard to stop and acknowledge all of the kindnesses which we receive from our readers. But I would like to take a moment to give due to all of you who have supported *MT*.

Thank you for your kind words of encouragement--and for well-needed prods to do better when we slip.

Thank you for sending in news clippings and suggestions for stories when you come across something you would like to share with us.

Thank you for your patience when an issue arrives late due to an unforeseen postal delay.

Thank you for the Christmas cards which were read and enjoyed by all, then displayed proudly on our office walls.

Thank you for staying with us, watching us grow from an eight-page newsletter to a major 64-page tabloid magazine.

Thank you for your confidence when you place multiple-year subscriptions; we know we'll be here and it's comforting that you do, too!

Grove to Speak at Charlotte Hamfest

It's a sure sign of spring--it's hamfest time! If you've never had the experience of attending one of these spectacles, you owe it to yourself to do so. Some of the larger hamfests have dealer tables as far as the eye can see and a parking-lot flea market to match.

Many excellent bargains can be picked up, both new from competitive dealer tables as well as used in the "boneyard". And the forums are particularly informative for those of you with an insatiable curiosity.

As a case in point, this month in Charlotte, North Carolina, at the Convention Center (4th and College Streets), there will be an SWL and scanner forum Saturday, March 21 at 10 AM. Bob Grove will be the forum speaker and anyone interested in attending the forum is invited to participate. There is no additional charge beyond that of general admission to the hamfest (see adjoining advertisement).

The MT Reader Survey

Part I: Who is the "average" reader?

In the January issue we enclosed a reader reply card which invited everyone who received a copy of *MT* to let us know his personal tastes in listening and equipment; now it is time to assemble, collate and analyze the data.

Thousands of responses came pouring in; it should be a straightforward task of coming up with a typical reader's profile, right? After all, the average of mixing equal amounts of white and black paint is grey--shouldn't we be able to do "average out" the responses on the cards?--a simple matter of adding the responses in each category and dividing by the number of responses in that category.

However, when you are dealing with people and not quantities, "average" requires further definition. If it were that simple, the "average" skin color in a racially-mixed neighborhood would be grey and the average religious affiliation in Ireland would be Catholic-Protestant!

Statisticians have long recognized the problems associated with trying to find a commonality among discrete subjects; that is why they don't use the term "average", but they do use terms like "norm", "mean", "mode", and "median".

Still, we'll do the best we can in trying to find some common denominators shared by the majority of *MT* readers; hopefully, our sampling will be representative of listeners in general. Your responses have been thoughtful and helpful and will have strong influence on future issues of *MT*. We are grateful for your participation.

NEXT MONTH (hopefully!): Part II: The Results.

1987 CHARLOTTE HAMFEST AND COMPUTERFAIR

Sat. March 21 9:00 AM to 5:00 PM — Sun. March 22, 9:00 AM to 3:00 PM — Charlotte Convention Center, 4th & College Streets, Charlotte, NC

Forums - Manufacturer and Dealer Booths - Flea Market Tables

Admission Still at 1983 Prices!

Preregistration: \$5.00 ; At-the-door \$6.00 (valid both days)
Flea Market tables: Preregistration \$10.00 ; At-the-door \$12.00
Prereg. deadline March 14, 1987 - Mail requests + S.A.S.E. and check to: Charlotte Hamfest, P.O. Box 221136, Charlotte, NC 28222-1136. Talk-in frequency - 145.29 MHz

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Communications Report

Cellular Industry Misinforms FCC

In an apparently continuing policy of misinformation, the Cellular Telecommunications Industry Association (CTIA) has submitted erroneous comments to the FCC stating that "The national organization of ham radio operators [ARRL] did not oppose the Privacy Act."

In fact, the ARRL did oppose the wording of the Act and has replied to the Commission, "Both in official Board of Directors policy actions and in oral and written testimony before [Congress] the League indicated its dissatisfaction with the Bill."

They continued, "...restrictions on frequency access by owners of radio receivers are misguided and unfair." The League contends that privacy should be maintained through encryption and that labeling should be added to warn the user that his communications are not private.

The First Jammer?

Broadcasters should take heart when they suffer the indignity of deliberate jamming in the knowledge that Marconi himself suffered the same assault at the turn of the century.

As Marconi was providing to the press live coverage of the Americas Cup Yacht Race off Long Island in 1901, an unscrupulous competitor was jamming Marconi's spark transmission with another spark transmitter!

The raucous zapping noise was seemingly erratic since it would occasionally stop, then begin again. It was later learned that the pattern was actually a code used to send information to the competitor's receiver as a brick was alternately picked up and set down for varying periods on the Morse code key!

Secret U.S./Contra Network Revealed

An exclusive *Philadelphia Inquirer* story recently provided details of a clandestine HF (shortwave) single sideband voice network between the United States and Central American contra bases.

Apparently funded by money diverted from the Iranian arms sale fiasco, two U.S. Army special forces veterans were hired to provide the radio communications between Northern Virginia and bases in El Salvador and Costa Rica.

The U.S. base was first installed at the offices of American National Management Corporation in Vienna, Virginia, about 15 miles west of Washington, DC. Three 12-foot towers were erected on the roof to support the antenna system, but complaints of interference on ANMC's computers and the attention the large structure would bring forced the base to move.

Next, the equipment was moved to the Landmark Building in Alexandria, Virginia, a high-rise member of an apartment complex which girdles the nation's capitol. But the equipment never established contact with the Central American constituents, nor with controversial mercenary pilot William Cooper who was shot down by Nicaraguan government forces. (Contributed by George Primavera, Cherry Point, NJ)

(Ed. Note: When the U.S. Air Force investigated the Cooper incident, a number of code names were used including "Playboy" [U.S. Government], "Top Floor" [Washington, DC], and "Fruit Stand" and "Hammer Hole" [individuals].)

Police Frequencies on the Move

In an effort to avoid co-channel congestion as well as casual eavesdropping by scanner enthusiasts as well as criminals, police agencies across the country are taking steps to move higher in frequency to the emerging 800 MHz "cellular" band.

Even small agencies like the Baxter County (Arkansas) sheriff's department anticipates moving to 800 MHz within the next two years to join the system now in use by the Arkansas State Police, a trunked system which automatically switches frequencies to adjust for user loading. (Contributed by Harold Wilson, Mountain Home, AR)

Sensitive Freqs Published by Feds

With all the attention given uninvited radio monitoring and sensitive government information leaking into the wrong hands, it would seem unlikely that frequencies utilized by the military for private base communications would be publicized indiscriminantly.

Nevertheless, a recent public bid widely distributed by the United States Air Force lists the following frequencies used by Andersen Air Force Base on Guam: (F1) 163.4375; (F2) 163.4625; (F3) 163.5375; and (F4) 163.100 MHz.

Novice Enhancement is Here!

When the FCC first created the Novice class amateur radio license, the purpose was to give restricted beginners' privileges to those who would like to taste ham radio without fully getting their feet wet. Low power Morse code operation was allowed on 80 and 40 meters along with 'phone privileges on two meters.

A few years later, the ARRL (American Radio Relay League) convinced the FCC to delete voice privileges as part of their so-called "incentive licensing program" and the numbers of new hams dropped dramatically in the years that followed.

Now, the FCC has authorized vastly expanded privileges for Novices in what they term an "enhancement" program, targeted at enticing more potential hams to the hobby. It will work well. The ARRL is receptive to the new regulations.

New regulations restore voice privileges to Novices in the 28, 220 and 1240 MHz bands. It is expected that the new authorizations should be in effect by press time. Details will be found in next month's Ham Band column by Mike Mitchell.

U.S./Soviet Hotline Sends Pictures

Formerly capable of text only, the famed "Hotline" (previously known as the Direct Communications Link) between Washington and Moscow has been upgraded to allow the exchange of graphic and pictorial information.

The upgrade of two satellite circuits and one wired telegraph circuit follows a 1984 agreement that facsimile exchange of maps and similar visual data to more quickly resolve misunderstandings during crises. (From Dave Alpert, NY, NY)

British Spy Satellite Flap

British citizens are disturbed over the BBC's disclosure that a secret satellite program, code named Project Zircon, will lead to that country's first orbiting of a spy in the sky.

The \$700 million satellite will reduce British intelligence's dependence upon U.S. surveillance satellites, but questions have arisen regarding the

costly project and the breach of former secrecy in disclosing the plans for such an undertaking.

While authorities close to the project insist that the documentary on BBC did not divulge any classified information, it was learned that U.S. spy satellite manufacturer TRW will assist in the development. Just last month Britain rejected their own Nimrod aircraft in favor of importing the American AWACS early warning aircraft. (Contributed by Ruth Hesch, NY)

Greenpeace Changes Radio Links

The Greenpeace Foundation, noted worldwide for its aggressive conservationist activity at sea and on land, has changed its radio communications network.

Formerly using conventional ship-to-shore frequencies and commercial coastal radiotelephone facilities, Greenpeace has recently switched to INMARSAT satellite links which provide immediate press inter-communication capability.

Additionally, plans are underway to install an Antarctic base camp which will rely on HF SITOR (radio-teletype) and may include a ham station as well.

MT hopes to present an extensive article on Greenpeace in the near future.

Coach Fired for Eavesdropping on Opponents

Next time you go to a football game, keep an eye on the sidelines. Coaches and other officials are often seen wearing radio headsets, most frequently utilizing frequencies in the 49.83-49.89 MHz range or 151.625, 154.570 or 154.600 MHz itinerant channels.

Head football coach Mike Weaver of Langley (Virginia) High School was fired for "unsportsmanlike behavior" for tuning in on a rival school's play-by-play communications last fall and passing the information on to his team. (From Robert Eisner, Wheaton MD)

Spring into Action!

Antenna time is here! We've saved up all our featurettes, tips and you-name it on antennas and in the April issue we're going to sock it to you-- No fooling!

World Radio News

We welcome your contributions of station news and schedules and loggings for this column. Send station news and schedules to Larry Miller, 3 Lisa Drive, Thorndale, PA 19372-1034 and your loggings to Gayle Van Horn at 160 Lester Drive, Orange Park, FL 32073.

Argentina

The English schedule for RAE Argentina is:

0100-0200	9690, 11710 kHz (Americas)
0400-0500	9690, 11710 kHz (Americas)
1745-1845	15345 kHz (Europe/Africa)
2100-2200	15345 kHz (Europe/Africa) Mon-Fri
2100-2200	(Europe/Africa/America) Sat, Sun (BBCMS)

Radio Provincia de Santa Cruz is a new station on 6100 kHz testing with 500 watts. The station has been heard between 1000-0600 UTC. (SCDX)

Bangladesh

Radio Bangladesh's English service operates on the following schedule:

0800-0830	11645, 12030 kHz (Europe)
1230-1300	12030, 15525 kHz (Europe)
1815-1915	6240, 7505 kHz (Europe) (BBCMS)

Brazil

The schedule for Radio Nacional de Manaus on 4845 kHz is Monday through Saturdays 0900 to 1530 UTC and again from 2100 to 0330. Sundays the station is heard from 0900 to 1300 and 2100 to 0300 UTC. (ADXN)

Chile

Radio System Nacional de Chile reportedly plans to reactivate 9550 kHz from 1030 to 0400 UTC in parallel with 15140 kHz. (SCDX)

Clandestine

The new Contra AM station, Radio Liberacion, is now on the air. The frequency is 1520 kHz and the station will broadcast 6:00 AM to 6:00 PM local time, reportedly from San Jose, Costa Rica. The purpose of the station, according to Radio Liberacion spokesman Alphonso Roberlo, is to "break the [information] blockade" and "guide the Nicaraguan people in their attitudes." It is not known if Radio Liberacion will replace the existing rebel station on shortwave, Radio 15 Septiembre (on 5950 and 6264 kHz) which Roberlo admitted was "heavy on propaganda" and which had become "something of a joke." (Steve Forest, Cincinnati, OH)

Radio Farabundo Marti, which claims it is operating from Chalatenango province in El Salvador, is back on the air. It has been heard on 6735 kHz at 1830 UTC. Its other transmission is at 2300 UTC and both last for roughly an hour.

Recent monitoring of Radio Venceremos shows that it is being chased around the dial by top 40 rock music. Venceremos was heard signing on at 1400 UTC on 3725 kHz only to change frequency every few minutes, eventually reaching 3725 kHz in its attempt to avoid a top-40 jammer trying to blot out its broadcasts. Several days later, during its 2000 UTC transmission, it was again chased by the rock station, running up and down the bands between 6564 and 6670 kHz. Radio Venceremos claims to broadcast from Morazan department in El Salvador. The location of the rabid rock station is unknown.

Egypt

Radio Cairo's schedule in English is:

0200-0330	(Americas) 9475, 9675 kHz
1215-1330	(Asia) 17675 kHz
1630-1830	(Africa) 15255 kHz
2015-2145	(Europe) 9655 kHz
2030-2200	(Africa) 15375 kHz (BBCMS)

Ethiopia

The Voice of Revolutionary Ethiopia is being heard in English on 9560 kHz from 1459 to 1530 UTC. (RCI SWLD)

Germany, West

Radio Free Europe has reportedly resumed a brief press review in English. It's heard Friday at 2115 on 9725 kHz in the Czechoslovak service. The frequency is heavily jammed. Parallel frequencies include 3970, 6135, 7200 and 11855 kHz, according to the WRTVH. (RCI SWLD)

Iceland

The Icelandic State Broadcasting Service continues to pop up on new frequencies. It's been found on 11745 kHz at the unscheduled time of 1608 UTC with news in Icelandic. At 1626, a woman announced "Utvarp Reykjavik" and the transmission continued past 1630. Carrier plus USB, as usual, with much improved audio. (Bob Hill, Sharon, MA)

Indonesia

RRI Manado on 3215 kHz, fair around 2135 UTC with gamelan orchestra accompanying wayang kulit performance narrated in Indonesian by a man and woman. Dual 4753 kHz (Ujung Pandang), so must have been a relay of either Jakarta or Nusantara 4. Faded out around 2145 UTC. Note: In a report last month I referred to the

RRI theme music before the news broadcast as "Love Ambon." This is incorrect. It's "Song of the Coconut Islands." (Bob Hill, Sharon, MA)

International Waters

High Adventure Ministries in California, which just launched KVOH a few months ago, confirmed that they are still planning to start an off-shore religious station in Southeast Asia. The single-frequency ship-board shortwave transmitter will use a vertical, polarized log-periodic antenna. High Adventure Ministries is now negotiating on the purchase of a boat and hopes to have the facility on the air this year.

Italy

Radio Uno, Caltanissetta, heard on 6060 kHz from 2102 to 2106 kHz with good signals. Programming was in Italian. (DXSF via ODXA)

Iraq

According to the official program schedule, Radio Baghdad broadcasts in English from 0100 to 0300 UTC on 11750 kHz and again from 2100 to 2300 UTC on 15120 kHz. Each broadcast includes news, political commentary, press review and "The Song of Today."

Sunday: The Economic Programme, A Tour with the Microphone; Monday: With the World Press, Post-Bag Corner; Tuesday: Iraq and the Process of Development, From Our Heritage; Wednesday: The Cultural Programme, The City Tour; Thursday: Palestine Programme, Miscellanea; Friday: Post-Bag Corner, The Week in Review; Saturday: Question and Answer Programme, History of Iraqi Art. (Ed Janusz, NJ)

Jordan

The Ministry of Information in Jordan has placed an order with the transmitter manufacturer Brown Boveri for three 500 kW shortwave transmitters to be installed at Qasr Kherane. The project also calls for a 1000 kW AM and two 600 kW long wave transmitters, plus antennas. (ODXA)

According to the most recent schedule, the English Service of Radio Jordan on 9560 kHz has been extended. The new schedule is 1230 to 1700 UTC. Previously, the transmission ran only until 1500. (DSWCI)

Kenya

The Voice of Kenya was found on 4934 (ex-4885) at 1926 with a man in Swahili; choral number at 1930 then into dialog or drama. Operating in parallel with the National Service on 6150. Checked again at 2007, by which time it was a whopping signal, then off at 2012. The General Service was heard on 4915 kHz, dominating Ghana at 2013 with English announcements,

song dedications and ads (one for sparkling beverage brewed in Nair that "restores your vitality"); greetings as well. (Bob Hill, Sharon, MA)

Kiribati

Radio Kiribati was reported shortwave from 0000 to 0130 UTC 14802 kHz USB and 16433. Heard with a relay of Radio Australia news 0100. (ODXA)

Korea, North

Korean Central Broadcasting Station found on 5871 from 2218 with grandiose choral outpouring and orchestral accompaniment; off at 22 after short announcement in Korean. Not parallel 2850 kHz but did seem to be carrying the same program as 64 which continued after 2230 UTC. The 5871 kHz outlet (which, like 4770, not mentioned in the *World Radio Handbook* despite having been active for decades), appears to operate very irregularly. (Bob Hill, Sharon, MA)

Lesotho

Radio Lesotho's 100 kW transmitter on 4800 kHz has been off the air for the past few months. This has been the case in Cameroon in the clear on 4795 kHz the evenings although the signal is not very strong. The reason for Lesotho's departure from the airwaves is not known. (RNMN)

Libya

The Soviet Union is responding to the new Voice of America site in Israel with a site of its own in Libya, the Awbari region, north of Sabha. Targets for the new site, which will include shortwave, AM and TV, will be "eastwards to the Kingdom of Saudi Arabia, westwards to the Atlantic Ocean, and southwards to the Equator." See also "Israel."

Jamahiriyah has been heard in English on 7245 kHz from 2240 to 2320 UTC however the station still announces 11815 kHz. The schedule remains unstable.

Malaysia

Radio Malaysia, Kuching Sarawak, is being heard with the Bidayuh service at 0445 UTC on 713 not 7120 kHz as in the 1986 WRTV. Neither channel is given in the 1991 edition. Other Sarawak services are heard at the same time on 6050, 7140 and 7160 kHz. (RCI SWLD)

Mali

Problems with the staff of RTV Mali have been avoided when Information Minister Gakou Fatou Niang made as her "first priority" the regular payment of staff salaries.

RTV de Mali on 7286 kHz with

(Please turn to page 59)

SIGNING ON:

The Christian Science Monitor Becomes a Global Broadcaster

By the Christian Science Publishing Society Staff
Office of the Director of Communication and Information

The *Christian Science Monitor* has long been one of the constructive citizens in the world of international newspaper publishing. Day after day for more than 75 years the *Monitor* has striven to speak with a clear, factual, and unbiased voice in order to help thoughtful people everywhere understand and deal with important issues of the day.

Now the *Monitor* announces the beginning of a major addition to its journalistic capabilities. In mid-March 1987, over the powerful and far-reaching medium of shortwave radio, it is extending its voice and purpose to Europe, the Middle East and Africa from a shortwave transmitting facility in Maine, USA.

Later this year a second transmitter will be broadcasting programs from a new station on Saipan in the Mariana Islands that will be heard in Japan and South Korea and, ultimately, in China, Southeast Asia, Australia and New Zealand. And in 1989 a transmitter in the southern United States, still in the planning stage, will broadcast to Mexico, Central America, South America and Canada.

This is not the first time *The Christian Science Monitor* has turned to shortwave. During World War II it was used to carry the message of the *Monitor* beyond the locked borders of nations. And today we're using it again, to reach out across borders to speak with clarity, care and accuracy to people of all cultures and all educational backgrounds.

With these new facilities, the *Monitor* will have a voice which, when combined with the print and other electronic media, matches the power of founder Mary Baker Eddy's original concept for it—to provide a clear,

constructive, non-sensational view of the world and to inspire individuals to seek solutions that help advance the human race as a whole.

Why Shortwave?

Only over shortwave can *The Christian Science Monitor* serve the "global village" daily and hourly in a direct and economic fashion, free of constraints. With the installation of our own 500-kilowatt transmitter in Maine, and the purchase of our facility in Saipan, we are joining with major broadcasters throughout the world to provide quality news as well as inspirational programming.

Sites:

As already mentioned, there are to be three shortwave transmitting stations situated to cover the world; one in the northeastern part of the United States at Scotts Corners, Maine; the second in the Pacific on the island of Saipan in the Marianas, and a third in the southern United States.

The Scotts Corners station is a one-story New England-style building that shares the site with three towers. Two of the towers are 363 feet high, and one is 212 feet high. They support a pair of dipole curtain antennas. The 500,000-watt transmitter feeds into the curtain antenna system which, in turn, sends out an effective radiated power of 50 million watts. This makes Scotts Corners the world's most powerful non-governmental shortwave station!

The transmitter and all the other equipment at the site in Maine are of the highest quality available. In fact, the transmitter/antenna system represents the state-of-the-art in



shortwave broadcasting technology. The specifications and equipment standards will be duplicated by the transmitter in Saipan and the southern U.S.

Programming

The news and information programming will include summaries of the world's news on-the-hour and at-the-half-hour; excerpts from that day's edition of the newspaper; cultural features, and information from *The Christian Science Monitor's* impressive world-wide news-gathering network. In addition, there are background discussions with *Monitor* writers, editors, and guests, along with interviews from around the world. "The World Service of *The Christian Science Monitor*" is presented in live two-hour editions Monday to Friday, each edition being introduced by two hosts.

Additional religious and inspirational programming will also be transmitted. Called "The Herald of Christian Science," it will offer programs of wide general interest including interviews with Christian Scientists and conversations with

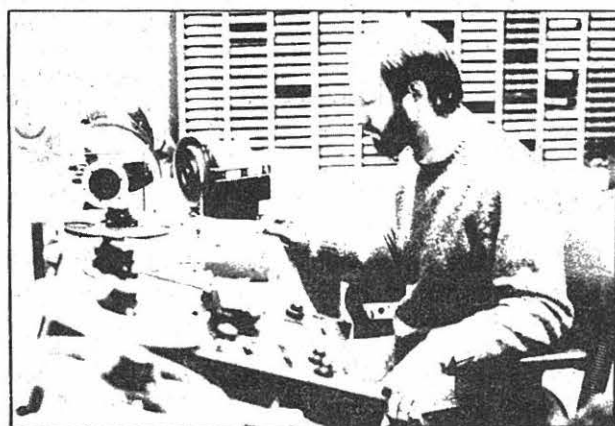
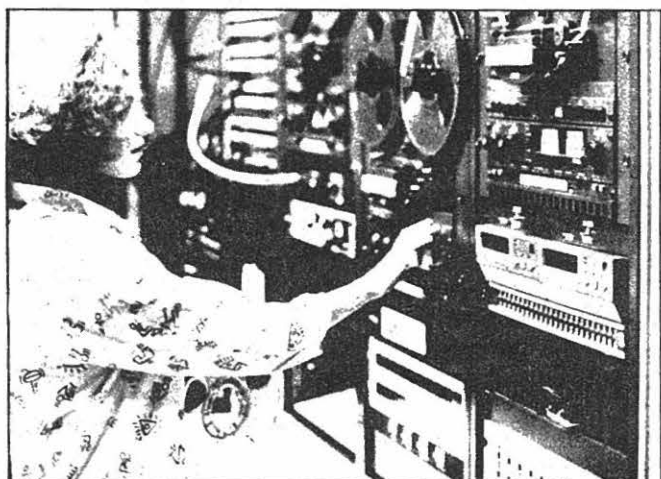
Christian Science lecturers. At the weekend, the Sunday church service will be broadcast from The Mother Church in Boston. In addition, there will be a panel discussion program called "Christian Science in Today's World." It will be about topical subjects of world interest and how Christian Scientists apply their religious convictions to such issues.

All of the news and inspirational programs are produced in our Boston studios. The programs are then transmitted via satellite to Maine. Every two hours the signal from the transmitter in Maine will be electronically switched to four slews—45°, 60°, 90°, and 105°. For two hours the signal will be directed toward northern Europe and the U.S.S.R.; for the next two hours to West and South Africa, to Central Europe, and then to West and East Africa.

Schedule:

The two-hour programming time blocks beamed toward different areas of the world will be constant for each of those areas seven days a week. All news programs out of Maine will be in English for the time being, with 15 minutes of French and 15 minutes of German in the last half-hour of each two-hour weekday edition of the "Herald." Other language broadcasts will be introduced over the next two years with Spanish and Portuguese, especially on our southern U.S. transmitter.

A quarterly Program Guide will be inserted into the newspaper's daily and world editions. The Guide lists local listening times and frequencies as well as descriptions of the programs. It also carries articles of general interest and advertising.

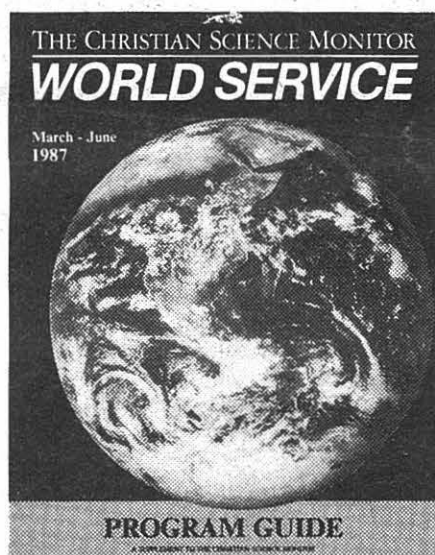


Photos show *Monitor* broadcasting facilities in Boston

International shortwave broadcasting schedule

UTC	LOCAL TIME										FREQUENCY (kHz)		LANGUAGE	PROGRAMS				
	UK Western, Central & S. Europe	Northern & W. Europe	Western USSR	Eastern Europe	Middle East	West Africa	Central Africa	South Africa	East Africa	India	March 1- May 3	May 3- Sept 6**		MONDAY-FRIDAY	SATURDAY	SUNDAY		
1600	4pm	*		5pm						*	15280	15270	Eng	World Service (news) 1st hr.	Eng	Wknd. W/Sv. (news) 1st hr.	Eng	C.S. in Today's World
1700	5pm	*		6pm						*	15280	15270	Eng	World Service (news) 2nd hr.	Eng	Wknd. W/Sv. (Kal.) 2nd hr.	Eng	Church Service
1800						6pm	*	8pm	*		21640	15230	Eng	World Service (news) 1st hr.	Eng	Wknd. W/Sv. (news) 1st hr.	Eng	Church Service
1900						7pm	*	9pm	*		21640	15230	Eng	World Service (news) 2nd hr.	Eng	Wknd. W/Sv. (Kal.) 2nd hr.	Eng	C.S. in Today's World
2000	8pm	9pm	*		9pm	10/11pm†					9465	15265	Eng	World Service (news) 1st hr.	Eng	Wknd. W/Sv. (news) 1st hr.	Eng	Church Service
2100	9pm	10pm	*		10pm	11/12mid†					9465	15265	Eng	World Service (news) 2nd hr.	Eng	Wknd. W/Sv. (Kal.) 2nd hr.	Eng	C.S. in Today's World
2200							10pm	11pm		1am	7365	15300	Eng	World Service (news) 1st hr.	Eng	Wknd. W/Sv. (news) 1st hr.	Eng	Church Service
2300							11pm	12mid		2am	7365	15300	Eng	World Service (news) 2nd hr.	Eng	Wknd. W/Sv. (Kal.) 2nd hr.	Eng	C.S. in Today's World
0000	12mid	1am	*		1am	2/3am†					7365	7365	Eng	Herald of C.S. †† 1st hr.	Eng	Herald of C.S. Wknd. Ed.	Eng	Herald of C.S. Wknd.
0100	1am	2am	*		2am	3/4am†					7365	7365	E/F/G	Herald of C.S. 2nd hr.	Eng	C.S. in Today's World	Eng	C.S. in Today's World
0200							2am	3am		5am	9465	9745	Eng	Herald of C.S. 1st hr.	Eng	Herald of C.S. Wknd. Ed.	Eng	Herald of C.S. Wknd.
0300							3am	4am		6am	9465	9745	E/F/G	Herald of C.S. 2nd hr.	Eng	C.S. in Today's World	Eng	C.S. in Today's World
0400							4am	*	6am	*	9840	9465	Eng	Herald of C.S. 1st hr.	Eng	Herald of C.S. Wknd. Ed.	Eng	Herald of C.S. Wknd.
0500							5am	*	7am	*	9840	9465	E/F/G	Herald of C.S. 2nd hr.	Eng	C.S. in Today's World	Eng	C.S. in Today's World
0600	6am	*		7am	9am	*				*	7365	9465	Eng	Herald of C.S. 1st hr.	Eng	Herald of C.S. Wknd. Ed.	Eng	Herald of C.S. Wknd.
0700	7am	*		8am	10am	*				*	7365	9465	E/F/G	Herald of C.S. 2nd hr.	Eng	C.S. in Today's World	Eng	C.S. in Today's World
0800							8am	*	10am	*	7365	9465	Eng	Herald of C.S. 1st hr.	Eng	Herald of C.S. Wknd. Ed.	Eng	Herald of C.S. Wknd.
0900							9am	*	11am	*	7365	9465	E/F/G	Herald of C.S. 2nd hr.	Eng	C.S. in Today's World	Eng	C.S. in Today's World
1000							10am	*	noon		17640	17640	Eng	Herald of C.S. 1st hr.	Eng	Herald of C.S. Wknd. Ed.	Eng	Herald of C.S. Wknd.
1100							11am	*	1pm		17640	17640	E/F/G	Herald of C.S. 2nd hr.	Eng	C.S. in Today's World	Eng	C.S. in Today's World

*Possible signal at local time.
†Includes two time zones.
**This is the tentative schedule for the summer season;
it is subject to revision.
††The Herald of Christian Science.



A Global Publishing Activity

It was in early January 1984 that the *Monitor* first expanded onto public radio in the United States, distributed by American Public Radio, with a one-hour weekend program called "Monitoradio." It is now carried on over 220 stations.

Today the *Monitor* also produces a daily half-hour edition of "Monitoradio" now carried by over 100 stations. In addition, a daily half-hour commercial radio program called "Conversations with *The Christian Science Monitor*" is carried on over 40 stations across the U.S. In Europe, a forty-five minute program called "The Weekend Edition of *The Christian Science Monitor*," is heard each Sunday night over Radio Luxembourg. Its regular listenership is over 400,000.

During 1985 the *Monitor* also entered the world of television in the United States with "The Christian Science Monitor Reports," a weekly half-hour program. This is expanding into daily programming over our own local Boston television station, Channel 68, WQTV.

All of these programs are being incorporated, in some form or another, into The World Service of *The Christian Science Monitor*. As a result, every element of today's *Christian Science Monitor* is being made available to the world.

Ownership and Operation

To meet this expanded publishing concept and its accompanying responsibilities, *The Christian Science Monitor* Syndicate has been established. The Syndicate owns and operates the shortwave facilities as well as our own Boston television station. The Syndicate is an Equal Opportunity Employer.

An Invitation...

Please write to *The Christian Science Monitor* if you would like to receive further information. We will be happy to send you a sample of our Program Guide. Please write to:

The Manager's Office P-818
The Christian Science
Publishing Society
One Norway Street
Boston, MA 02115 U.S.A.



From Soup to Nuts...

Station News * DX Tips * Advance Program Details *
Frequencies * Equipment News * Articles * and More

If you're a serious shortwave listener, you know the need for up-to-the minute information. And that's what World Radio Report is all about. From the world's most comprehensive station news section to advance program details to the latest equipment, World Radio Report has it all. From editors that know what they're doing -- Larry Magne on equipment, Gail Van Horn on loggings and Larry Miller on station news. Plus guest columnists from around the world.

If you're serious about your shortwave, you owe it to yourself -- and your radio -- to check out World Radio Report. One year of World Radio Report is just \$18.00. Sample copies are just \$2.50 in the U.S.; \$3.50 elsewhere in the world. Send check, money order or cash to World Press International Inc., 3 Lisa Drive, Thorndale, PA 19372. From the publishers of International Radio.

World Radio Report
It's nothing flashy. It's just the best.

An Introduction to SURVEILLANCE

by Jerry V. Cody

Modern law enforcement depends greatly on electronic surveillance devices to thwart criminal and terrorist activities. Today's lawman needs much more than the traditional six senses of the old West to arrest an outlaw. To counter bad guys in a high tech society, a law enforcement officer has to employ specialized equipment.

Radio communications play a paramount role in the field of electronic surveillance. Gone are the days of the simple callbox linking an officer in the field with police headquarters. Today, equipment can pinpoint an officer's position on a station wall map should he or she not be able to respond verbally.

Keeping posted on the activities of other officers while conducting a stakeout is a major factor in making an arrest--and surviving. Many electronic devices are available for the convenience as well as the protection of undercover investigators.

Spectrum Displaying Receiver

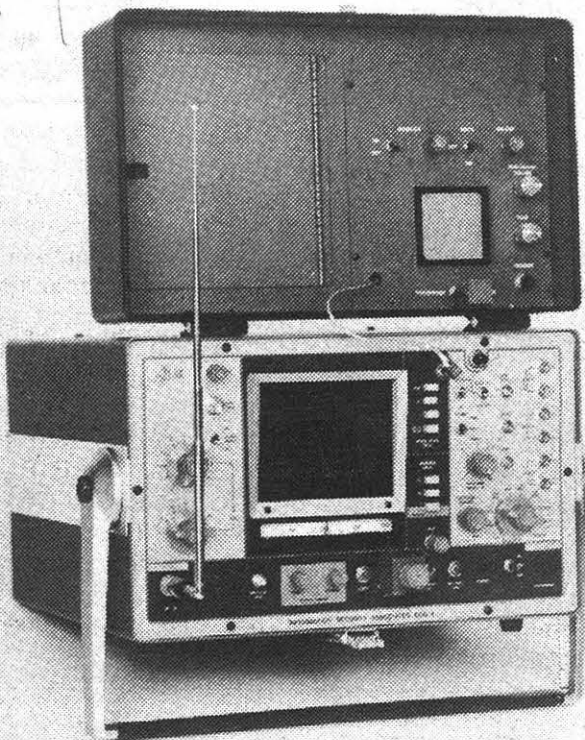
One invaluable piece of hardware is the spectrum analyzer; This piece of equipment can pinpoint an outlaw's transceiver frequency anywhere in the range of 0.4 through 1000 MHz.

The spectrum analyzer can sort through the interference of an extremely strong signal being broadcast legitimately and lock on to a crook using a radio carrier for illegal purposes. The spectrum analyzer's sensitivity enables the detection of radio signals one million times smaller than local radio broadcaster; an audio/visual display helps identify the broadcast.

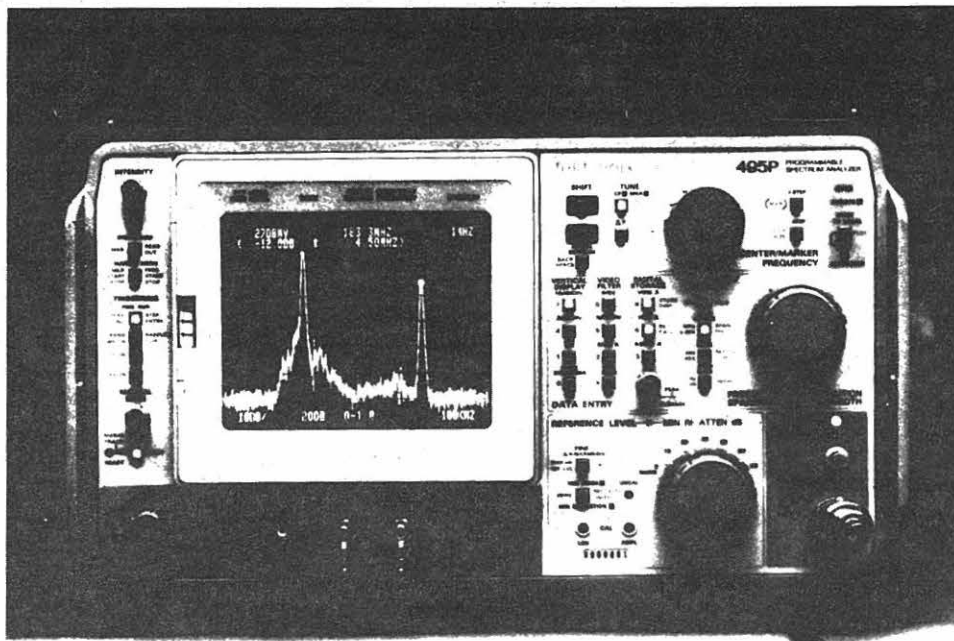
Versatility comes into play when law enforcement makes use of programmable mobile transceivers. Units of this type usually operate in the VHF high (134 through 174 MHz) and UHF (406 through 512 MHz) bands. The programmable transceiver has a power output of 25 watts and operates off 12 volts D.C. A built-in microprocessor is utilized to select a particular frequency.

The Long Range

If authorities need to broadcast outside of normal VHF/UHF range, they can use a long-range HF (high frequency--"shortwave") radio system that employs single sideband and CW (continuous wave--Morse code). This device operates out of a luggage-type suitcase and has a transmitting output of 100 watts.



The Texscan AL-51 series spectrum analyzers are popular surveillance receivers (Photo courtesy Herbert, Inc.)



Two strong "pips" (signal traces) are displayed on a Tektronix 495P portable spectrum analyzer.

To put this system into operation requires simply plugging it into an A.C. wall socket or 12 volt battery power source, laying out an antenna for the frequency chosen, and tuning the device on frequency.

Porta-peaters

Portable repeaters are one step removed from the conventional hilltop boosters; briefcase-contained and operating in the frequency range of 150 through 174 MHz, a 15 watt unit can be a life saver to law enforcement personnel tracking a desperado through a wooded area or swamp.

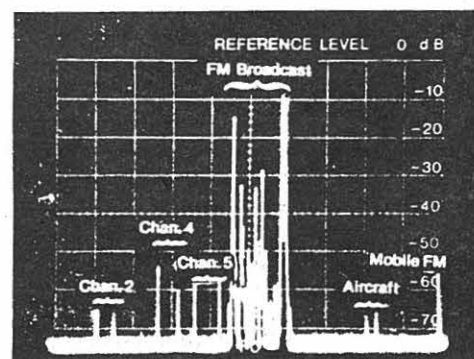
"Body Bugs"

One tool that has saved many a law enforcement officer's life is the body wire. Worn under street clothing of detectives engaged in undercover activities like dope buys, gunrunning, or infiltration of criminal or terrorist organizations, these devices have been used for over 20 years.

Body wires are an undercover officer's link with backup a short distance away. They provide valuable testimony as court evidence when used in conjunction with recording equipment.

One body microphone kit provides 1/4-mile range and is the size of a cigarette pack. Crystal controlled and operating in the frequency range of 150 to 220 MHz, it has a sensitivity of .25 microvolt for 70 decibels of quieting. A short rubber ducky or flexible wire antenna is used with standard batteries supplying the power.

The miniature transmitter is commonly referred to as a "bug." Statistics show the bug to be one of the most reliable pieces of law enforcement equipment (Less than a 6% failure due to components). Even the wireless microphone used in the entertainment industry will suffice.



A spectrum display of 50-150 megahertz showing signals on the air at that moment (Photo courtesy Cushman Electronics)

One bug on the market is the ultra-miniature transceiver that looks like an ordinary writing pencil. This device operates in the 148 to 174 MHz frequency range on two switch-selectable channels with a power output of 2 watts.

Bugs operate on the following frequency ranges:

- 30 to 50 MHz
- 88 to 120 MHz
- 150 to 174 MHz
- 400 to 512 MHz

Monitoring these frequency ranges for bugs can be exciting for communications buffs, especially in the 30 to 50 MHz range where ionospheric propagation or "skip" is present. Some powerful bugs, under the right conditions, have been reported hundreds--or even thousands--of miles away!

Next Month Part II: Counter surveillance--Not being compromised.

Jerry Cody, a freelance writer for MT has an Associate in Arts and Science degree with a major in sociology from Lower Columbia College. A trained investigator with extensive military law enforcement and surveillance experience, Jerry is an ardent shortwave and scanner listener.

Classification and Security: The Inside Story

Part I - Classification and Access

by Menlo DuPem

ORGANIZATION

The Classification System within the U.S. Government gives the appearance of being very mysterious and complicated when actually it is only very detailed. It is, in fact, both straightforward and logical. The Security System suffers from the same perception, but is equally logical.

If there are any confusing and ridiculous aspects to these systems, it is usually found in the way most people handle or react to their responsibilities working within the system. They are often paranoid about it (but not totally...after all, the Russians and others really are after the information!).

Even though dozens of thick Regulations, Manuals, etc., are required to explain it all, I will give you a clear description of it in just a few thousand words!

The Classification and Security Systems for the U.S. Government are controlled by the Secretary of Defense and, by written agreements, apply to the following departments, agencies and all their sub-organizations. They include every government organization which handles classified information except the Department of Energy which, because of its outgrowth from the Atomic Energy Commission, has its own parallel system.

Agencies Under Official Classification

Department of Agriculture
Department of Commerce
Department of Interior
Department of Justice
Department of Labor
Department of State
Department of Transportation
Department of Treasury
Arms Control and Disarmament Agency
Environmental Protection Agency
Federal Emergency Management Agency
Federal Reserve System
General Accounting Office
General Services Administration
National Aeronautics and Space Administration
National Science Foundation
Small Business Administration
United States Information Agency

These organizations, for the purposes of the Classification and Security Systems, are called "user agencies" (UA).

CLASSIFICATION DESIGNATIONS

The Classification System has three (and only three) levels of classification: *Confidential*, *Secret*, and *Top Secret*. All other so-called "classifications" are actually access control designations which limit access to classified information and material to a need-to-know basis, and source designations which indicate the sensitivity of sources of information.

Confidential:

This designation is applied to information or material the unauthorized disclosure of which could be reasonably expected to cause damage to the national security.

Examples of "damage" include the compromise of information that indicates strength of ground, air, and naval forces in the U.S. and overseas areas; disclosure of technical information used for training; maintenance and inspection of classified munitions of war; and revelation of performance characteristics, test data, design, and production data on munitions of war.

Secret:

This designation applies only to information or material the unauthorized disclosure of which reasonably could be expected to cause *serious* damage to the national security.

Examples of "serious damage" include disruption of foreign relations significantly affecting the national security; significant impairment of a program or policy directly related to the national security; revelation of significant military plans or intelligence operations; and compromise of significant scientific or technological developments relating to national security.

Top Secret:

This designation is applied only to information or material the unauthorized disclosure of which reasonably could be expected to cause *exceptionally grave* damage to the national security.

Examples of "exceptionally grave damage" include armed hostilities against the U.S. or its allies; disruption of foreign relations vitally affecting the national security; the compromise of vital national defense plans or complex cryptologic and communications intelligence systems; the revelation of sensitive intelligence operations; and the disclosure of scientific or technolog-

ical developments vital to the national security.

ACCESS CONTROL DESIGNATIONS

In addition to basic classification, most classified information also has access controls under the Special Access Program, based upon a "need to know." The permanent access control designations under this program include, but are not limited to:

Critical Nuclear Weapon Design Information (CNWDI):

Contains information about design theory and/or operation.

Crypto:

Contains information about cryptologic design or keys.

Exclusive Distribution (EXDIS):

To be distributed only to those named on the distribution list.

Eyes Only:

To be seen only by the person or persons to whom the information is addressed and no others.

For Official Use Only (FOUO):

Used on unclassified information not to be released to the public or, in other words, not available under the Freedom of Information Act.

Formerly Restricted Data (FRD):

Indicates information controlled by the Department of Energy under the Atomic Energy Act of 1954 (as amended) and is, for practical purposes, NOFORN even though it is no longer RD (see below).

Limited Distribution (LIMDIS):

To be distributed only to the addressee and his or her staff (on a need to know basis).

No Contract:

Not to be distributed to or seen by contractor civilians (non-government personnel).

No Distribution (NODIS):

To be distributed only by the originator as, and if, required. Usually seen by only a few people who are not allowed to pass it on.

No Foreign (NOFORN):

Not to be distributed to any foreign nationals. U.S. citizens only. *Top Secret* and *Crypto* is automatically NOFORN without being so marked. If it is releasable to some foreigners, it will be marked such as, "NOFORN except Canada and UK" or the like.

Organization Only:

As in CIA ONLY, or NSA ONLY, or NSC ONLY, etc. To be distributed only to personnel within the named organization.

Restricted Data (RD):

Indicates material contain information protected by the Atomic Energy Act of 1954 (as amended) regarding nuclear weapons material and the classification controlled by the DOE.

All CNWDI, RD and FI marked information is controlled by the DOE and all DOD/UA clear personnel must receive special approval in addition to the regular DOD clearance.

Sensitive Compartmented Information (SCI):

Indicates very sensitive information (usually intelligence) which can only be seen on a strict need to know basis. People who work together on the same basic project will often not know what the person at the next desk is seeing or handling!

Special Access Required (SAR):

Indicates information about the U.S. or foreign space program (regular and spy satellites, etc.) Strictly controlled by need to know.

Special Category (SPECAT):

Indicates information for military commanders or operational specialists which is limited only

(Please turn to page 27)

Listener's Handbook

by
Bob Grove

The equipment and the
techniques for monitoring
the first 1,000 MHz of the
radio spectrum

A goldmine of information for SWL
and Scanner Monitors alike!

Loaded with illustrations, photographs, charts, diagrams, and lists. Subjects include frequency classifications, radio wave propagation, users of the spectrum, frequency allocations, types of emission, security and surveillance, choosing your receiver, station layout, reconditioning receivers, scanners, accessories, antennas, interference and its cures, listening hints.

Also included are exciting home projects for the experimenter.

94 pages; 8-1/2" x 11"
softbound \$12.95

plus \$1.50



GROVE
ENTERPRISES
PO BOX 98
BRASSTOWN,
NC 28902

12 Timely Tips for Better QSLing

by Herr Dr. Wolfgang Weissbach

"Translation" by Larry Miller

Have things slowed down in your mailbox recently? Are the number of cards and letters verifying reception of exotic lands becoming fewer and fewer? Then you need a dose of Dr. Wolfgang's "12 Timely Tips for Better QSLing." Known as "Doctor QSL" to the thousands of readers of his monthly column in the East German magazine, Staatliches Assoziation Duetschsprachiger Rundfunk DX-er, (a publication of the Staatliches Komitttee fur DX-ing), Weissbach promises that "if after reading this article, if you don't see an absolutely dramatic rise in the number of QSLs visiting your radio room, then I'll mail you some of mine."

These are good times for DXers. Reception conditions are on the rise. Technology, much of it developed in East Germany, has brought shortwave radio listeners around the world some of the most sophisticated receivers ever available to the consumer. And new and better publications bring to enthusiasts the latest information on what's to be heard on shortwave.

At the same time, these are times of trouble for anyone who doesn't consider those loggings -- no matter how exotic -- complete until they have been confirmed by a QSL card or letter. The problem is that economic hard times have struck much of our globe, particularly in the Third World countries whose stations often represent the best DX to catch.

These financial problems have, in some cases, meant reduction in staff. And if you ran a station and were told by the government to "cut back", where would you put the knife -- programming, engineering or support staff? Since programming is the purpose of any broadcast station and engineering the means to "get it out," the place obviously marked for the surgeon's blade is support staff. And it is these very people who verify reception reports and fill out and mail QSL cards.

Still other problems contribute to the grey cloud looming on the horizon of QSLing. Rising postal costs -- skyrocketing inflation in some capitalistic countries -- have simply become too much for the oppressed staff at some stations to handle.

The upsurge of interest in shortwave listening has taken its toll on the art of QSLing as well. There are more and more reception reports arriving in sack after sack at those now unattended desks. An avalanche is a hard thing to handle even when you have a snow shovel, is it not? But when both the snow shovel and the snow shoveler have been taken away, there is no stopping it!

So here comes the avalanche down QSL mountain. How do you insure that your simple reception report is

not swept away with the thousands of others? The situation is not yours to control, but there are a few steps you can take to at least insure that your reception report has the best possible chance of generating a reply. Here are a dozen of my "tried and true tips" that will help, as they say in the West, "improve your hitting average."

1. Make sure that you are sending your report to the correct address. Use the *World Radio TV Handbook* or *QSL Address Book* (available in North America from Miller Publishing and other fine dealers) for the proper addresses.

2. Look through your favorite magazines to the latest news on QSL cards. Station addresses do occasionally change. And look for changes in the names of people who sign the QSL cards. You can find these, occasionally, I am told, in the Radioactivity section of this magazine. When you see such a name (called a "verification signer" or "v/s"), send your report to his or her attention.

3. Include return postage either in the form of International Reply Coupons (IRCS) or mint stamps of the country to which you are writing. Remember, too, that IRC's are not only expensive, but are often useless in remote areas where stations are either not close to a post office or the post office isn't familiar with IRCs. In these cases, mint stamps will work better. Call your local state stamp shop and inquire about how you can obtain these.

4. Submit an accurate and complete report. Provide at least thirty minutes of program detail if you are writing to a broadcaster. Don't generalize your information. Instead, provide an item-by-item "log" of what you heard. But don't overdo. No one at the station wants to have to wade through a sixty page word-for-word script of their own broadcast.

5. Where appropriate, include some comments on the programming you heard -- what you liked and didn't like, and why. Again, use the common sense. If you write to the

Voice of Amerika and tell them that everything you heard was nothing more than unlistenable bourgeois propaganda, there's a strong possibility you may fail to get a response.

6. Send the letter by airmail. No one lives long enough, even in East Germany, to receive a reply by surface mail. If you've written to a station before and did not get a response, you may even consider spending the few extra Marks to send it by registered mail.

7. Make your report stand out from the rest. Send something extra -- picture postcards of your area, used commemorative stamps, or, depending on what you look like, photos of you or your family -- in short, anything that you feel would interest station personnel yet is lightweight and fits into a number 10 size envelope. Note that it is illegal to send East German Marks [and U.S. dollars--ed.] to most foreign countries.

8. Be polite and friendly. Don't demand that your letter be answered. The station is under no obligation to do so. The trick is to make these overworked people who really don't want or need your reception report, *want* to respond to your letter.

9. Where possible, try building your reception report over a period of days or even weeks so station personnel can compare reception over a period of time. But be honest. Telling a 500 watt station in Itititi, Peru that they came in "like a local" in the middle of the day seems like a natural way to get their attention, but living in a Third World nation doesn't make one foolish!

10. If it seems likely that no one at the station speaks English, try to accommodate them--French for the former African colonies, Portuguese

to Brazil, Spanish to the rest of Latin America, and Indonesian to that country. While the really aggressive QSL collector might even take his report to a local university for translation into Swahili, there are easier ways, such as Herr Gerry Dexter's *Language Lab* series of books. Each book has a number of key reception report phrases in English and alongside them their French or Spanish equivalents. Thus, you can build a foreign language reception report without knowing a single word of the language. The books are available from your favorite shortwave store.

11. Be patient. Don't badger the station about your QSL, making a bad impression of you and your country. Give your QSL a minimum of three months before you send a follow-up.

12. Keep several copies of your original report for use as a follow up -- if necessary. If possible, send a new logging in addition to the copy of your old one, just to let the station know you're still out there, listening.

If you make these twelve tips part of your standard operating procedure on writing and sending reception reports, I guarantee that you'll enjoy better results. You'll still have your share of stations that don't seem to reply no matter what you do. Even I have come across one or two of these during my fifty wonderful years of QSLing the peace-loving nations of the world.

Still, despite the problems we've examined, the fascination with QSL remains a high priority for many DXers. Perhaps the little more time effort and expense required today only serve to increase the challenge

The views in this article are those of the author and do not necessarily reflect those of the staff and management of Monitoring Times.



Tracking the Cuban Mystery on 1160

by John Santosuosso

That something out of the ordinary happened the night of December 2 (EST) is certain. What it all means and why our government may not want us to know about it is less clear. Perhaps in the days ahead we may obtain more pieces to the puzzle, but this is what has emerged up to now.

On the night of December 2, from his Pennsylvania location, John Demmitt decided to tune to 1160 kilohertz on the medium wave (AM) band. He suspected that Castro might be up to something, because that day was the thirtieth anniversary of the Cuban revolution. It did not take long to confirm his suspicions.

A Cuban transmitter could be heard as early as 6:18 p.m. EST. According to an F.C.C. spokesman in Washington, it continued to broadcast until approximately 11:30 pm. EST. Among other things, John heard a speech by Castro in which he was highly critical of the country's farm and factory workers. The Cuban leader remarked that he had walked into a factory unannounced and found the employees taking a coffee break. He claimed that the Cuban work force was not producing what it could and this was severely hurting the country.

Demmitt notes that while propagation conditions that evening favored signals coming from the direction of Cuba, he was still impressed by the strength of the signal. Regular readers of this column may recall that for many months we have suggested paying some attention to 1160, because if the Castro regime ever did begin its "Radio Lincoln" broadcasts in retaliation for Radio Marti, this is where they would most likely appear.

Several years ago, this writer was informed by a very reliable source that Castro has four Czech-made 500 kW transmitters capable of broadcasting on the medium wave band. And if this is the case, the Cubans certainly have the capability to put an extremely strong signal on 1160.

Interestingly enough, Demmitt has discovered that the F.C.C. has been assigning an unusually large number of American stations to the same frequency. Just two years ago there were five American and one Canadian stations located there. The lone Canadian remains but there are now nine Americans already on the frequency, four more plan to go on the air, eight others are to move there from other frequencies, and

there is one application to increase power.

The special Cuban broadcast did not escape the attention of the U.S. Federal Communications Commission, which under the terms of the legislation creating Radio Marti is supposed to monitor broadcasting activity from the island. In order to make various tests, the F.C.C. asked several stations to leave the air for periods of approximately five to eight minutes. Among these stations were KSL (1160) in Salt Lake City, KMOX (1120) St. Louis, and WHO (1040) in Des Moines. The engineering department of WHO confirmed for this writer that they did sign off at approximately 6:50, 7:05, 8:05, and 9:05 PM CDT.

According to the Washington office of the F.C.C., they were concerned about 1040 kHz, because there has been some unusual Cuban activity on that frequency in the past. They found none on December 2, nor did Demmitt. WHO did receive as many as twenty phone calls from as far away as Omaha from people who claimed to be hearing a Spanish-language transmission. Demmitt believes they were hearing something, but it was nothing more than the usual broadcast of Cuba's Radio Victoria, which was enjoying the favorable propagation conditions of the evening.

The F.C.C. says it received no direct complaints about interference on 1160. However, it was aware that KSL had received several and that the problem appeared to be the result of the special Cuban broadcast.

The unusual Cuban transmission was reported on December 2 and December 3 by several major American radio stations. Among these were WHO, KMOX, and Pittsburgh's KDKA. Strangely enough, the print media -- although it had reported on such matters previously -- seems to have been completely silent this time. The *New York Times*, *Washington Post*, *Miami Herald*, and *Miami's* Spanish language *Diario las Americas* carried not one word about the transmission.

If the reaction of the press is odd, that of the F.C.C. is far more bizarre. All F.C.C. monitoring stations are in constant contact with each other through a telephone teletype network, and their activities are coordinated through the Watch Officer in Washington. Two

monitoring stations, both of which are active in monitoring Latin American radio transmissions, told this writer that they knew nothing about the December 2 transmission. In fact, we were told by one spokesman that with one minor exception, there had been "nothing out of the ordinary from Cuba during the past month."

The sole exception had been an extended broadcast on December 11 by Cuba's Radio Taino. This station on 1160 kHz has Spanish and English language programs primarily for tourists. It normally leaves the air at 6:00 pm EST. On the above date it continued broadcasting until 8:30 pm to cover a youth festival. An F.C.C. field office also refused to comment on the December 2 broadcast, saying that it did not get involved in that sort of thing.

Finding anyone in Washington willing to say anything became a real challenge, as on several occasions F.C.C. personnel referred this writer to disconnected federal agency numbers. Finally, one person did indeed confirm that the F.C.C. had monitored a December 2 broadcast from Cuba. However he declared that the media had confused the entire matter. The transmission, he continued, was nothing more than

another extended broadcast from Radio Taino, and F.C.C. tests had determined that Radio Taino was using no more than its usual power. He did note that the station did normally use more than the 501 permitted American broadcaster.

Adding to the mystery is the fact that the Associated Press did cover the story of the Cuban anniversary transmission. In its first release it claimed that the F.C.C. had stated that it was trying to identify a Cuban station that had been broadcasting 250,000 watts on 1160 on the AM band, interrupting some domestic broadcasts." In a slightly later release, information about transmitter power was deleted and a statement inserted that "the F.C.C. Washington would not comment about the matter late Tuesday."

At this point, we must leave you to draw your own conclusions about the meaning of all of this. Something will happen. What it was and whether not government officials do not want us to know about it is up to you to decide. Information from anyone having further details about the event would be welcome.

The author would like to thank John Demmitt for his tremendous help in the report.

MONITOR



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Sidelights on Cellular

806-960 MHz: Who's Up There?

With the passage of the Electronic Communications Privacy Act (ECPA) and the advent of scanners covering the "new" 800 MHz band, listeners are beginning to investigate that part of the UHF spectrum. Who's up there and what can be heard?

Basically, there is very little difference between the 800 MHz band and the conventional UHF land mobile band (450-512 MHz). True, antennas are shorter, distances are somewhat reduced, equipment is more expensive, and signals behave in a more line-of-sight fashion, but the services to be found there are much the same.

The 800 MHz band is the harbor for those licensees who have fled from the lower VHF and UHF frequencies because of interference from congestion-urban RF pollution. Thus, metropolitan areas are the

most likely candidates for finding 800 MHz inhabitants.

Two-frequency simplex or full duplex (mobile telephone) are common, especially below 900 MHz, with base and mobile frequencies separated by exactly 45 MHz.

The 806-960 MHz band is a hotly-contended portion of the spectrum, with the FCC seriously considering auctioning off licenses to the highest bidders. The profits to be made by the communications industry in this frequency range are considerable.

The band plan changes from time to time to equalize the load of applicants from various services. This recent table of frequency allocations was compiled from various sources; some frequencies have been rounded off to the closest 25 kilohertz. We would appreciate corrections from our readers.

806-960 MHz FREQUENCY ALLOCATIONS

806-810	BUSINESS conventional systems mobile
810-816	PUBLIC SAFETY slow growth systems mobile
816-821	BUSINESS SMR trunked systems mobile
821-824	PUBLIC SAFETY mobile
824-835	CELLULAR MOBILE TELEPHONE nonwireline (RCC) mobile
835-845	CELLULAR MOBILE TELEPHONE wireline (Bell) mobile
845-846.5	CELLULAR MOBILE TELEPHONE nonwireline (RCC) mobile
846.5-849	CELLULAR MOBILE TELEPHONE wireline (Bell) mobile
849-851	LAND MOBILE SATELLITE (reserved) mobile
851-855	BUSINESS conventional systems base
855-861	PUBLIC SAFETY slow growth systems base
861-866	BUSINESS trunked systems base
866-869	PUBLIC SAFETY base
869-880	CELLULAR MOBILE TELEPHONE nonwireline (RCC) base
880-890	CELLULAR MOBILE TELEPHONE wireline (Bell) base
890-891.5	CELLULAR MOBILE TELEPHONE nonwireline (RCC) base
891.5-894	CELLULAR MOBILE TELEPHONE wireline (Bell) base
894-896	LAND MOBILE SATELLITE (reserved) base
896-898.5	BUSINESS SMR
898.5-899.75	INDUSTRIAL LAND TRANSPORTATION
899.75-901	BUSINESS
901-902	GENERAL PURPOSE MOBILE RADIO
902-928	AMATEUR RADIO
928-928.35	DOMESTIC PUBLIC private multi-address (reserved)
928.35-928.85	DOMESTIC PUBLIC (reserved)
928.85-929	DOMESTIC PUBLIC wide area paging (reserved)
929-929.75	DOMESTIC PUBLIC (reserved)
929.75-930	DOMESTIC PUBLIC voice paging
930-931	DOMESTIC PUBLIC digital paging
931-932	DOMESTIC PUBLIC common carrier paging
932-935	GOVERNMENT PRIVATE SHARED operational fixed
935-937.5	BUSINESS SMR
937.5-938.75	INDUSTRIAL LAND TRANSPORTATION
938.75-940	BUSINESS
940-941	GENERAL PURPOSE MOBILE RADIO
941-944	GOVERNMENT PRIVATE SHARED operational fixed

800 MHz CONVERTERS

A recent letter from an MT reader inquired as to the effectiveness of add-on 800 MHz converters for scanner reception. He wanted to know whether or not we considered them a good investment.

At the present time there are three manufacturers--and a fourth to announce soon--of converters for portions of the 806-960 MHz "cellular band"; these include Hamtronics (65 Moul Rd., Hilton, NY 14468-9535 (their 806-894 MHz model costs \$88 plus \$3 shipping and handling); Critique Electronics, 21 4th St., Downers Grove, IL 60515 (their model 800 covers 800-912 MHz and sells for \$139.95 plus \$3 shipping and handling); and RF Limited, PO Box 1124, Issaquah, WA 98027 (their UV-800 lists for \$99.95).

All of these devices share several common characteristics which include:

- The owner must supply a 12 volt power supply
- Converters cannot be left in circuit, but plugged in to use and unplugged to restore the scanner to normal;
- They cover only the lower portion of the 806-960 MHz allocation;
- The frequency display on your scanner will not be changed--you have to add a three-digit number to the reading each time you wish to know the receive frequency;
- You cannot use your scanner on any of its normal bands while the converter is in use.

Because of the inconvenience of their use and the fact that there are scanners on the market which satisfactorily cover that range for less additional cost than adding a converter, we recommend an add-on converter only for those listeners who already have a scanner that they do not choose to replace.

We have not had the opportunity to test any of the units presently on the market and would like to hear from those of you who have experience with such converters to share your findings with other MT readers.

944-947	BROADCAST studio-transmitter link (aural)
947-952	BROADCAST auxiliary
952.1-952.7	PRIVATE MICROWAVE omnidirectional control
952.8-956.1	PRIVATE MICROWAVE operational fixed
956.25-956.45	PRIVATE FIXED signalling and control
956.5-959.8	PRIVATE MICROWAVE operational fixed
959.85-960	COMMON CARRIER wide area paging

Cellular Woes

Commentary by Bob Grove

The cellular telephone lobby, in an effort to reassure their customers that their mobile telephone calls are private, instigated the recently-passed legislation which created the Electronic Communications Privacy Act (ECPA). But the ramifications of the ramrod effort have resulted in quite a bit of backwash.

Publicity surrounding the monopoly's maneuvering in Washington has increased public awareness of the cellular phone band and piqued curiosity among hobby listeners who have ready access to the two-way radiophone calls on conventional scanners.

One reporter monitored two Baltimore politicians as they openly discussed a romance going on between two of their colleagues.

Southwestern Bell admits to monitoring the cellular calls of one of their competitors as a means of keeping an edge in the market. The competitor complains that the surveillance is illegal and that Bell can use the phone numbers heard for sales leads. Bell denies that, saying they don't listen to the conversations, only the data part of the call.

Cellular promoters try to convince their critics and their prospective customers that cellular "handoffs"--switching frequencies and repeater sites--occurs rapidly so that no one can eavesdrop very long. In fact, scanner listeners regularly hear entire conversations because hand-offs do not occur that often, especially in slow metropolitan traffic, and calls are kept short because they are expensive.

The inordinate publicity brought on the Act by the antics of the industry has created such a public awareness of the vulnerability of the conversations that use of the system has dropped considerably, a serious blow to vested interests who hoped to cash in on the lobby's efforts in Washington.



ECPA AFTERMATH: The Oregon Ogre

Fresh on the heels of the successful implementation of the Electronic Communications Privacy Act, the 64th Oregon Legislative Assembly has already had committee hearings on its proposed anti-listening bill, House Bill 2189.

Amending ORS 165.540 and repealing ORS 133.726, the new bill will make it unlawful in the state of Oregon to "Obtain or attempt to obtain the whole or any part of a telecommunication or a radio communication to which such person is not a participant...unless consent is given by at least one participant" or "if all participants in the conversation are not specifically informed that their conversation is being obtained."

A violation of the proposed law will constitute a Class A misdemeanor.

Clearly, no frequency range or service is excluded (other than broadcasting) by the wording of the bill, and shortwave utilities monitoring as well as scanning will become unlawful in that state if the bill passes.

In its present wording, amateur radio, CB, ship to shore, aircraft, and many other services presently open to listeners will be banned by the proposed law.

Oregon residents are urged to protest both by telephone and by letter to their representatives immediately as it would appear that the assembly is making rapid progress without opposition.

(Submitted by Gary Westfall, KG6ASP, Beaverton, OR)

Toledo Moving to 800 MHz

Following a nationwide trend among larger metropolitan areas, Toledo, Ohio, has received nearly \$1 million to implement the first phase of a new 800 megahertz communications link which will be shared by the police and fire departments.

The initial funds will be used to establish three microwave towers and emergency power equipment; the balance of the \$3.7 million commitment will make possible a 20 channel voice and data radio system which will permit computer terminals and printers to exchange vital data.

Firefighters look to the safety features of the new system which will allow graphic information like plans of a burning building to be radioed to the scene as well as hazardous substance details.

Cellular Crime in Canada

The Canadian Royal Canadian Mounted Police (RCMP) has reported considerable unlawful use of cellular mobile telephones by organized crime. The automatic switching among frequencies as a vehicle moves from cell to cell thwarts monitoring and, as scrambling devices become available for consumers, tapping in will be even more difficult.

(via Harold Sellers, Newmarket, Ont.)

It is expected that the new radio system will be operational some time this year, at least in its initial phases, with future expansion continuing. (Submitted by Tom Althoff, Sylvania, OH)

An Ode to the E.C.P.A.

Anonymous

The roses are gone; the violets, too,
Cellular monitoring, "800," too...
Along with our freedom to hear what we like,
Whether telephone calls or discreet body mikes.
Uncle Sam got his way and big industry won,
Add huge fines and some jail time to make it more fun!

Put the squeeze on the makers to alter their scanners,
The payoffs involved are all that now matters.
Instead of a warning upon the car 'phones,
They'll make certain scanners illegal to own!
The airwaves can now be sold outright for money,
To assume they are free is now totally funny.
The laws that get passed are the jokes of the day,
But the meanings run deep, I'm sorry to say.
If you are big business, then they've got the time,
To make laws for YOU...put your cash on the line!
I don't know about you, but I'm getting "hard-hearted,"
After all, I think this is the way Hitler started!

So think of it now while you still can, my friend...
'Cause the ECPA is the "start of the end."
AT&T may have won the first "round"...
But there's a lot more of us than of them in my town!!!

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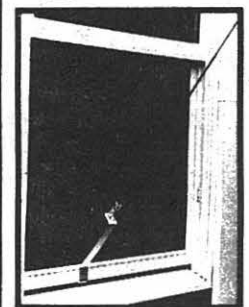
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DXing with the Eck-spurts

A Common-Sense Guide to DXing

Part III

by Larry Miller

DXing. There's probably no hobby so challenging and at the same time frustrating and confusing. There are hundreds and hundreds of possible frequencies on shortwave. And there are several stations on each. At the same time!

At any given time a station might be broadcasting in Farsi to the Middle East. Another might be in English to Asia. Yet another might be a clandestine station, shouting out its low power-message to anyone who might be listening along with a jammer broadcasting nothing but white noise over its signal in an attempt to blot it out. All this can be happening on the same frequency at the same time and the activity can make for some pretty difficult listening.

But wait. There are still more variables. Add to that the distance between the various stations, your location, the differences in transmitter power and the vagaries of the ionosphere and differences in receiver quality, antennas and accessories and you've got confusion with a capital "C".

Simply put, there is no guarantee that what's audible tonight will be audible the next.

The problem is that because shortwave listeners are spread out geographically -- the nearest one might be 100 miles away or your next door neighbor -- there's no way to compare what you're hearing with anyone else.

Am I hearing everything that I should? Am I a lesser form of life because I've never heard Mongolia's Radio Ulan Bator?

In this, part III of our four-part series, we present for your consideration the logs of two *Monitoring Times* readers -- Jack Belck (who uses a \$300 Sony ICF 2010 and a 30 foot longwire antenna) in Knoxville, Tennessee, and Harold Levinson (using a \$900 ICOM R-71A and 350 foot of wire wrapped around a cylinder) in Philadelphia. We thank everyone who sent in logsheets for the project.

Next month, we'll wrap up this series with by talking to one of the world's leading DXers and we'll find out some of the tricks of the trade.

We'll also present a quick course on DXing designed to maximize your chances of hearing the big game.

Harold Levinson, Philadelphia, PA

FREQ.	TIME	COUNTRY	STATION	9000 KHZ-9595 KHZ 0100 UTC-0200 UTC	PROGRAM
9022	0100	?	?	ILG - RDI	WEAK - ?
9034.5	0105			CARRIER	WEAK
9044	0105			CARRIER	WEAK
9050	0106			CODE	55555
9056.4	0107			CARRIER	1111
9070.4	0107			CODE	44444
9075	0108			CODE	44444
9085	0108			CODE	55533
9090	0109			BZZZ SAW	33333
9100	0109			CODE	44444
9110	0110			CODE	22222
9125	0111			CODE	33333
9130	0112			BZZZ SAW	33333
9144	0113			2 TONE	22222
9155	0113			CARRIER	—
9160	0114			CODE	33333
9174	0115			BZZZ SAW	11111
9197	0115			CODE WHEEL ?	22222
9227.1	0116			CODE	44444
9251	0116			CODE	44444
9266.3	0117			CARRIER	—
9343	0118			TELEPHONE ?	—
9360	0119	SPAIN		ILG - RDI	Y.L. SPEAKING
9380	0122			BZZZ	—
9385	0123			CARRIER	—
9395	0123	GREECE		ILG RDI	MUSIC
9420	0126	GREECE		ILG RDI	" 55555
9435	0127	ISRAEL			INTERNAL SIGNAL
9450	0128	USSR			MUSIC
9455	0131	VOA		ILG RDI	OM - Y.L. TALK
9465	0133		PARI ?	ILG RDI	OM - TALK
9470	0134	SS	MOSCOW	ILG RDI	OM - TALK
9475	0135	EGYPT	CAIRO - SS	ILG RDI	44444 Y.L. TALK
9490	0138		SS	LOCAL QRM	33333 OM. TALK
9500	0140	?	?	ILG RDI	22222 MUSIC
9505	0141	?	P. SVABODA	ALBANIA ?	33333 OM TALK
9515	0142	BBC		BBC	MUSIC SINGING
9520	0147	?	AS 9505 P. SVABODA		OM TALK
9525	0149	?	SOUNDS LIKE LUBA	—	OM. TALK
9535	0150	?	COULD BE RCI	IN SPANISH	OM. TALK
9540	0152		TWO STATIONS		OM. TALK - JAMMING
9545	0154	GER.	DW		STATION SIGNAL

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1986 FCC CALL SIGN INDEX MICROFICHE (only 3 left) - Once you know the call sign this list will identify the frequency, name of licensee, service, and location of the transmitter. Does not include amateurs, CB, boats, or aircraft. Includes the May and September, 1986 updates. \$15 value, sell for \$7.50 each including bookrate shipping.

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PO BOX 98
BRASSTOWN,
NC 28902

704-837-9200

FREQ	TIME	COUNTRY	STATION	9000 KHz - 9575 KHz 0100 UTC - 0200 UTC	PROGRAM
9550	0154				OM - TALK
9555	0155				OM - TALK
9560	0155	TURKEY		ILG - RDI	MUSIC
9565	0157				MUSIC
9570	0157	TURKEY DW			TURKEY - MUSIC DW INT. SIG.
9575	0158	ITALY			TALK
9585	0159				TALK
9590	0159	BBC			
9595	0200				MUSIC
FRIDAY 6 FEB 1987					

J. BELCIC
4315 HIWATHA
KNOXVILLE TN 37919

V = yours logged
all trace except as ind.

ICF 2010 30' LONGWIRE
+ GROVE TUNER

TIME	DATE	FREQ	STA/LOC	PROG	LANG	S	I	N	P	O	REF
0110	3 Feb 87	9015		MUSIC	SP						
	✓	9020		"	"						
		9060			ENG						
		9095		MUSIC	2 STAS						
		9105		"							
		9115		SPEECH							
		9125		1 ENG	2 STAS						
	✓	9360			SP						
	✓	9395			MID EAST	1					
		9410			SPX2						
	✓	9420		MUSIC	MID EAST						
		9430			ENG	2					
	✓	9455	VOA			1					
	✓	9465			SP						
	✓	9470			ENG?						
	✓	9475			SP						
	✓	9490			SP?						
	✓	9500		MUSIC	SP						
	✓	9515	BBC		ENG	1					
	✓	9520			3 STA						
	✓	9525			SP						
	✓	9530			?						
	✓	9535	RCI		ENG	1					
	✓	9545	RM?		"						
	✓	9550		MUSIC	SP						
	✓	9555			X2						
	✓	9560		"	MID EAST						

NO ATTEMPTS TO ID!



★ WORLD FRIENDSHIP ★

NIHIL EFFICI NON POTEST



A "SWL" C



★ THRU SHORTWAVE ★

Of all of the hobby clubs in existence, the American Shortwave Listeners Club is probably the most informal. Based in Huntington Beach, California, its character reflects the "best of the west." Editors are friendly and chatty. If one has a gripe, he or she airs it. If there's a new arrival in the family, you'll hear about it. Best of all, the loggings do not concentrate on the "impossible" but instead seem to provide a wide range of station listings.

The magazine, which weighs in at some 40 pages, is composed primarily of loggings from members. Those loggings are divided into 4 sections: The Americas, The Pacific, Africa and Europe, plus Utilities, Mediumwave, QSLs, DX Showcase (items of interest, schedules, and so forth), SW Review (programs), Member's Profile and a by-time index of the stations logged by members.

It ain't pretty, but it is fun. Sample copies are \$1.00 from The American Shortwave Listeners Club, 16182 Ballad Lane, Huntington Beach, CA 92649. Tell them Monitoring Times sent 'ya.

THE AMERICAS

Editor: John Fischer, Jr.

Antigua

5975 0535 BBC: EE: "New Ideas" #44 followed by Book Choice"; (444, 11/4, Tinsley-CA)

6045 0320 DW: EE: letters from listeners; (444, 11/9, Chorpenning-AR)

Argentina

11710 0020 RAE: SS: Argentine vocals; 333, 11/28, MacKenzie-CA)

Belize

3285 0510 Radio Belize: EE: various selections of pop mx, YL DJ; (333, 11/4)

Radio Canada International

9755 0035 RCI NA Service: EE: pgm "As It Happens" w/report on Liberal party MP complaining about the number of Conservative MPs appointed to committees; 333, 10/28, Tinsley-CA)

Costa Rica

4832 0300 R. Reloj: SS: lively LA mx, TCs and nx on the hour; (333, 12/11, Fischer-PA)

Dominican Republic

15045 2045 R. Discovery: EE/SS: mx, Soviet Radio ad, Miller Publishing ads, IDs; (242, 11/24, Neff-OH)

Nicaragua

6015 0135 La Voz de Nicaragua: SS: nice LA mx, many IDs, OM and YL ancrs; (444, 12/3, Blair-CA)

Peru

4790 1000 Radio Atlantida: SS: OM announcer w/possible news items then "musica cantina", a lively music program, many IDs and much tlk between selections; (33333, 12/3, Thomson-FL)

THE PACIFIC

Editor: Pete Grenier

Australia

4920 1200 A.B.C.-VLM-4/Brisbane; EE: OM announcer with ABC world news items, then into program on early cultural problems in Australia (333 11/30 Thompson-CA)

Indonesia

11790 1500 Voice of Indonesia: EE: S/on and news and ID as Voice of Indonesia from Jakarta (222 11/19 Tinsley-CA)

New Caledonia

7170 0640 RFO: FF: OM DJ with pop music (444 11/24 MacKenzie-CA)

AFRICA

Editor: Sandra Manning

Ascension Islands

6005 0107 BBC RELAY: EE pgm "Before Monday" soap opera format //6175. (252, 11/24, Earhart-NE)

Benin

4870 2250 ORTB-PARAKOU: FF: OM anncr interviewing another OM. (33433, 12/1, Thompson-FL)

Namibia

3270 2312 R. SWA: Afrikaans: EZL mx, (good, 11/20 Thompson-FL)

South Africa

21590 1455 R. RSA: EE OM/YL with tlk on physicians into jazz interlude to 1500. Then program "Africa Today" featuring nx and views with OM host. (25433, 11/28, Thompson-FL)

EUROPE

Editor: Greg Earhart

Albania

9480 2000 Radio Tirana: FF: IS, S-ON w/ID "Ici Tirana" & NX (333, 11/28, Prath)

Austria

6155 0142 Radio Austria Int.: EE: OM & YL anncrs, Nx abt Reagan/Iran decisions, Austria's poor during winter. Youth and Sports (333, 11/28, Choitz-IL)

Czechoslovakia

5930 0141 Radio Prague: EE: Czech Folk Music (232, 11/24, Earhart-NE)

Finland

15400 1440 Radio Finland: EE: Interview with elderly woman (444, 11/23, Trumpy-IA)

Greece

9395 2200 VOG: GK: IS, ID, & Nx by OM (322, 11/11 Chorpenning-AR)

Netherlands

13770 1455 Radio Netherland: EE: SW Feedback w/Nevel Grey and Dorothy Weir //5955, 11735, 15560 & 17575 (all weak) Some sort of echo disturbing x-mission (342 12/13, Earhart-NE)

Norway

15310 1600 Radio Norway Int: Nor: IS & ID in EE & Norwegian then px in Norwegian (444, 11/22, Chorpenning-AR)

Portugal

9680 0030 Radio Portugal: EE: Nx, Yx abt. Compact discs in Portugal, Sports, Time & Freq. Sked, Tourism in Portugal (344, 11/4, Choitz-IL)

Spain

6125 0040 Spanish Foreign Radio: SS: OM w/travel feature on the towns of Badajoz and Merida (332, 11/30, Frodge-TX)

Sweden

9695 2300 Radio Sweden Int: EE S-On with IS, fighting UNID SS St. w/ moderate success (222, 11/26, Shanmugam-KS)

Vatican State

9615 0000 Vatican Radio: SS: IS, S-On to Latin America "Este es, Voz de R. Vaticana." 444, 11/30, Prath-FL)

ACROSS THE DIAL

Editor: Spance Naylor

400	LKO	Billings, Montana	LKO	25w	0839
454	FNSI	"Esso Normandie"	CW	wkg NMA	0604
		(Sister ships are "Essopicardi" & "Esso Africa.")			
460	HKB	Barranquilla, Colombia	CW	traffic	0405
		(nice logging, good DX sn)			
500	VCP	St. Lawrence, Canada	CQ	DE OBS?	0540
2182	H--	Panama Radio	USB	w/tfc	0926
2434	NENH	"USS Pyro"	USB	w/tfc	0223
2500	WWV	Fort Collins, Colorado	AM	time sig	0458
2715	NWZR	"USS Mt. Hood"	USB	W/tfc	1056
2716	NEDW	"USS Prairie"	USB	w/tfc	0743
5628	a/c	"Japan Air 2"	USB	wkgKUA3	0307
5675		English fishing traffic	USB		0013
8299	UNGT	"THK Sergei Lazo" RYs to UFB	170/66n		0552
8484	HLF	Seoul, Korea	CQ		1607
13031	FUF	Fort de France, Martinique	V	DE	1642
13107	WOO	Oceangate, New Jersey	USB	w/wx	1232
14722	TNL	Brazzaville, Congo RYs DE 425/66r			1532
15035	CJX	St. Johns, Canada	USB	Volmet	2008

Cuba on AM

Shortwave listeners are probably familiar with **Radio Rebelde** on 5025 kHz. But on the AM dial, according to Larry Van Horn, the Cubans have 5 national networks and several provincial networks that are quite audible all over the U.S. In the last month he has monitored over 43 stations from Cuba using a small, Panasonic RF-B300 portable radio -- and no external antenna. The following is a short summary to

better aid *MT* listeners hear Cuba on their AM radios.

National Networks

Radio Rebelde: Cuban entertainment network (24 hours) on the following frequencies: 550 590 600 630 640 670 710 720 750.

Radio Reloj: 24 hour continuous news and commentary with clock like pulses marking the seconds; chime and timechecks on the minute (this is Cuba's WWV). It can be heard operating in parallel on 570

610 760 790 910 940 950 1180 1270.
Radio Progreso: 24 hours on the following frequencies: 640 660 740 800 820 850 870 880 900.

Provincial Networks

Radio Guama parallel on: 990 1000 1010 1020 1030 1090.

Radio Cadena Habana: parallel on 1080 1120.

Radio Sancti Spiritus on 1190 1210.

CMKS, La Voz de la COA on 1059 kHz (providing for a nice het on

1060 kHz stations) and 1070.
Radio Angulo on 1100 1120.

There are more stations these networks but these are most frequent visitors to radios North Florida. Listeners should have good luck in the late evening/early morning hours on these stations with simple equipment. And these stations will give you a better feel of Cuban life than Radio Havana will.

MEDIUMWAVES

Editor: Harold Frodge

Asia & Oceania

1215 Radio Filipinas, DYRF, Cebu City, Philippines FP/EE: ID, Very clean, talking & music (1030, 10/6, 222+ Boehnke-HI)

Americas

540 Radio Rumbo, TICAL, Cartago Rica SS: N.A., S-On announcements by OM, and into nice LA ballada. Some ads, then OM with news items, then folk songs. Weak but clear. (1100, 10/25, 253, Thompson-FL)

750 Radio One, Port Marina Jamaica: EE: YL announcer heard playing music mixture; reggae, U.S. pops, etc., numerous IDs as "Radio One", in/out with WSB (2340, 1-29, 333 WT-FL)

950 Radio Musical, Nacional CMBE, Arroyo Arenas Cuba: SS: Heard playing selection of classical music, YL with commentary & ID @ 1959. OM with ID, freq, and location @ 2000 then opera music (1950, 10/24, 343 Thompson-FL)

U.S.A. & Canada

540 CBK Watrous SK: CBC Nx & Wx to 0405; YL w/ID "This is CBC Radio Saskatchewan 540"; "Mostly Mx" w/opera (0430, 12/6, Fair, Frodge-TX)

760 WJR Detroit MI: Sports, SS stn., w/time pulses covered over by WJR (0417, 10/28, DV-FL)

850 KOA, Denver, CO: Kathy Bradshaw TX show. Denver Broncos FB, (0845, 12/2, 222 Kokinda-OH)

1100 WWWE Cleveland, OH: Call-in px on SX (0114, 11/12, Venderpoel-FL)

1560 WQXR New York, NY: Classical mx, ID, Nx, Sx, Wx, Repeat of top stories then px "NY at Night." (0358, 11/11, Venderpoel-FL)

QSL CORNER

Editor: Russ Lay

Albania: R. Tirana - 7310-cd, sked, 45 days (Engelberts-FRG)

China: Radio Beijing - 9860 - cd, sticker, pennant in 47 days (Engelberts)

India: A.I.R. - 9910 - f/d cd Meenakshi Temple cd in 43 days, IRC (Fosgren)

USA: Radio Earth via WHRI - 7400 Curacao Beach cd in 211 days (Neff)

Vietnam: VOV - 10040 cd in 46 days, EE rpt, IRC (Engelberts)

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frequency SECTION

LEGEND:

- * The first four digits of an entry are the broadcast start time in UTC.
- * The second four digits represent the end time.
- * In the space between the end time and the station name is the broadcast schedule.

S=Sunday M=Monday T=Tuesday W=Wednesday
H=Thursday F=Friday A=Saturday

If there is no entry, the broadcasts are heard daily. If, for example, there is an entry of "M," the broadcast would be heard only on Mondays. An entry of "M,W,F" would mean Mondays, Wednesdays and Fridays only. "M-F" would mean Mondays through Fridays. "TEN" indicates a tentative schedule and "TES" a test transmission.

- * The last entry on a line is the frequency. Codes here include "SSB" which indicates a Single Sideband transmission, and "v" for a frequency that varies.
- * Frequencies in bold are most likely to be heard regularly in North America.

We suggest that you begin with the lower frequencies that a station is broadcasting on and work your way up the dial. Remember that there is no guarantee that a station will be audible on any given day. Reception conditions can change rapidly, though, and if it is not audible one night, it may well be on another.

Frequency updates from readers are also welcome and should be sent to:

Larry Miller, Frequency Coordinator
Monitoring Times
P.O. Box 691
Thorndale, PA 19372

Anyone whose material is used will receive a certificate of appreciation from Monitoring Times. All frequencies on this list in bold have been heard by one or more MT monitors during the previous month.

The MT Monitoring Team

Greg Jordan, NC Gayle Van Horn, FL
Rich Foerster, NE

MARCH HONORARY MEMBERS

Greg Fairbrother, Bristol, CT
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Jerry Simon, New York, NY
Pete Wahlquist, Reseda, CA
Steven Walley, Moreno Valley, CA
Phyllis Werlin, Malden, MA

0000 UTC	[7:00 PM EST/4:00 PM PST]
0000-0015	Voice of People of Kampuchea 9693, 11938
0000-0030	BBC, England..... 5975, 6005 6120, 6175 7325, 9410 9515, 9590 9915, 12095
0000-0030	KGEI, California..... 15280
0000-0030	Radio Berlin International.. 6080
0000-0030	Radio Canada International.. 5960, 9755
0000-0030 M	Radio Norway International.. 9590, 9610
0000-0045	Kol Israel..... 5885, 7465 9435, 9815
0000-0050	Radio Pyongyang, North Korea 15140, 15160
0000-0100	Armed Forces Radio and TV.. 6030, 11790 15345, 17765
0000-0100	All India Radio..... 9910, 11715
0000-0100	CBC Northern Quebec Svce... 6195, 9625
0000-0100	CFCX, Montreal, Canada..... 6005
0000-0100	CFRX, Toronto, Canada..... 6070
0000-0100	CFVP, Calgary, Canada..... 6030
0000-0100	CHNX, Halifax, Canada..... 6130
0000-0100 TEN	Christian Science Monitor... 7365
0000-0100	CKFX, Vancouver, Canada..... 6080
0000-0100	KCBI, Texas..... 11910
0000-0100	KSDA, Guam (AWR)..... 15115
0000-0100 TEN	KVOH, California..... 9505
0000-0100	KYOI, Saipan..... 15405
0000-0100	Radio Australia..... 15160, 15240 15320, 15395 17750, 17795
0000-0100	Radio Baghdad..... 11750
0000-0100	Radio Beijing, China..... 9550, 15445
0000-0100v	Radio Dublin International.. 6910
0000-0100	Radio Havana Cuba..... 6090, 9740
0000-0100	Radio Korea (South)..... 15575
0000-0100	Radio Moscow, U.S.S.R..... 5915, 5940 6000, 6070 6170, 7115 7150, 7185 7215, 7310 13665, 15425 15590
0000-0100	Radio Sofia Bulgaria..... 6070, 11720
0000-0100	Radio Thailand..... 9650, 9665
0000-0100	Radio Veritas, Philippines.. 11905
0000-0100	Radio New Zealand Int'l.... 11780, 15150
0000-0100	RTL Luxembourg..... 6090
0000-0100	Spanish Foreign Radio, Spain 9630, 11880
0000-0100	Voice of America..... 5995, 6125 6130, 9455 9650, 9775 9815, 11580 11680, 11740 15205
0000-0100v	Voice of Nicaragua..... 6015
0000-0100	WHRI, Indiana..... 11770
0000-0100	WRNO Worldwide..... 7355
0000-0100	WYFR, Florida..... 9660, 15440
0015-0100	AWR, Costa Rica..... 15460
0030-0100	BBC, England..... 5975, 6005 6075, 6120 6175, 7325 9515, 9590 9915, 11750
0030-0055	BRT, Belgium..... 5910, 9925

0030-0100	HCJB, Ecuador..... 9870, 11910 15155
0030-0100 A	KTWR, Guam..... 15340
0030-0100	Radio Belize..... 3285
0030-0100	Radio Kiev, Ukrainian SSR... 6200, 9765 11790, 13645 15180
0030-0100 T-A	Radio Portugal..... 9680
0030-0100	SLBC, Sri Lanka..... 6005, 9720 15425
0030-0100	WINB, Pennsylvania..... 15145
0045-0100 M	Radio Cultural, Guatemala... 3300, 5955
0045-0100	Radio Korea World News Svc.. 7275
0045-0130	Radio Berlin Intl..... 6080, 9730
0050-0100	Vatican Radio..... 6030, 9605 11845

0100 UTC	[8:00 PM EST/5:00 PM PST]
0100-0115	All India Radio..... 6035, 7215 9595
0100-0115	Vatican Radio..... 6030, 9605 11845
0100-0120	RAI, Italy..... 6010, 9575
0100-0125	Kol Israel..... 5885, 7465 9435
0100-0130	HCJB, Ecuador..... 9870, 11910 15155
0100-0130	Radio Berlin International.. 6080, 9730
0100-0130	Radio Japan General Service.. 7140, 9675 15235, 17810
0100-0130	Radio Vientiane, Laos..... 7112v
0100-0145	Radio New Zealand Int'l.... 15150
0100-0145	WYFR, Florida..... 9555, 15440
0100-0150	Deutsche Welle, West Germany 6040, 6085 6145, 9545 9565, 11785
0100-0200	ABC, Perth, Australia..... 15425
0100-0200	Armed Forces Radio and TV... 6030, 11790 15355
0100-0200	BBC, England..... 5975, 6005 6120, 6175 7325, 9515 9590, 9915 11920
0100-0200	CBC Northern Quebec Svce... 6195, 9625
0100-0200	CFCX, Montreal, Canada..... 6005
0100-0200	CFRX, Toronto, Canada..... 6070
0100-0200	CFVP, Calgary, Canada..... 6030
0100-0200	CHNX, Halifax, Canada..... 6130
0100-0200	Christian Science Monitor... 7365
0100-0200	CKFX, Vancouver, Canada..... 6080
0100-0200	FEBC, Manila, Philippines.. 15315, 21475
0100-0200	KCBI, Texas..... 11910
0100-0200	KSDA, Guam (AWR)..... 15115
0100-0200	KVOH, California..... 9505
0100-0200	KYOI, Saipan..... 15405
0100-0200	Radio Australia..... 15320, 15395 17715, 17750 17795
0100-0200	Radio Baghdad, Iraq..... 11750
0100-0200	Radio Belize..... 3285
0100-0200	Radio Canada International.. 5960, 9755 11845, 11940
0100-0200 M	Radio Cultural, Guatemala... 5955
0100-0200 TES	R. Discovery, Dominican Rep. 6245v
0100-0200v	Radio Dublin International.. 6910
0100-0200	Radio Havana Cuba..... 6090, 9740
0100-0200	Radio Moscow..... 5915, 5920 5940, 6000 6070, 6130 6170, 7115 7185, 7195 7215, 7310 7440
0100-0200	Radio Moscow World Service.. 7130, 7315 11720, 11845

0100-0200	Radio Prague, Czechoslovakia 5930, 6015 6055, 7345 9540, 9740 11990
0100-0200	Radio Thailand..... 9665, 11905
0100-0200v	RAE, Argentina..... 9690, 11710
0100-0200	SBC Radio 1, Singapore..... 11940
0100-0200	Spanish Foreign Radio, Spain 6125, 9630
0100-0200	Sri Lanka Broadcasting Corp. 6005, 9720 15425
0100-0200	Voice of America..... 5995, 613 9455, 965 9775, 981 11580, 1168 11740, 1520 9680, 1179
0100-0200v T-A	Voice of Indonesia..... 6015v
0100-0200	Voice of Nicaragua..... 15145
0100-0200	WINB, Pennsylvania..... 9690
0100-0200	WHRI, Indiana..... 7355
0100-0200	WRNO Worldwide..... 7430, 939 9420
0130-0140	Voice of Greece..... 9870, 1515
0130-0200	HCJB, Ecuador..... 6155
0130-0200	Radio Austria International.. 6025, 611
0130-0200 W,A	Radio Budapest Hungary..... 9520, 983 15135, 1527 6480, 727
0145-0200	Radio Veritas Asia, Philipp. 15135, 1527 6480, 727

0200 UTC	[9:00 PM EST/6:00 PM PST]
0200-0215	Vatican Radio..... 6145, 712 9650
0200-0225	Kol Israel..... 5885, 746 9435
0200-0230	BBC, England..... 5975, 600 6120, 617 7325, 941 9515, 959 9915
0200-0230	Burma Broadcasting Corp.... 7185
0200-0230 T-A	Radio Budapest, Hungary.... 6025, 611 9520, 983 11790, 153
0200-0230 M-F	Radio Canada International.. 5960, 975
0200-0230	Radio Korea World..... 7275, 118 6135, 966 9725, 981 12035
0200-0230 T-A	Swiss Radio International.. 9725, 981
0200-0230	Voice of Nicaragua..... 6015
0200-0230	WINB, Pennsylvania..... 15145
0200-0250	Deutsche Welle, W. Germany.. 6035, 721 9650, 968 11945
0200-0256	Radio RSA, South Africa.... 6010, 611 9615
0200-0300	ABC Perth, Australia..... 15425
0200-0300	Armed Forces Radio and TV... 6030, 117 11790, 153
0200-0300	CBC Northern Quebec Service. 6195, 96
0200-0300 TEN	Christian Science Monitor... 9745
0200-0300	GBC, Guyana..... 5950
0200-0300	HCJB, Ecuador..... 6230, 98
0200-0300	KCBI, Texas..... 11910
0200-0300	KSDA, Guam (AWR)..... 15115
0200-0300	KVOH, California..... 9505
0200-0300	KYOI, Saipan..... 15405
0200-0300	Radio Australia..... 15240, 153 17795
0200-0300	Radio Belize..... 3285
0200-0300	Radio Bras, Brazil..... 11745
0200-0300	Radio Bucharest, Romania.... 5990, 60 9510, 95 9835, 118 11940
0200-0300	Radio Cairo, Egypt..... 9475, 96 9900
0200-0300 T-A	Radio Canada International.. 5960, 97
0200-0300 TES	R. Discovery, Dominican Rep. 6245v

frequency **SECTION**

0200-0300 T-S	Radio Dublin International..	6910	
0200-0300	Radio Havana Cuba.....	5965, 6035	
		6090, 6035	
		6140, 6190	
		9740	
0200-0300	Radio Japan.....	15420, 15195	
		17825	
0200-0300	Radio Korea, South.....	11810	
0200-0300	Radio Moscow.....	5915, 5940	
		6000, 6070	
		6130, 7115	
		7215	
0200-0300	Radio New Zealand Int'l....	15150	
0200-0300	Radio Polonia, Poland.....	6095, 6135	
		7145, 7270	
		9525, 11815	
		15120	
0200-0300	Radio Thailand.....	9665, 11905	
0200-0300 TES	Radio Veritas, Philippines..	9740, 15195	
0200-0300	SBC Radio 1, Singapore.....	11940	
0200-0300	Sri Lanka Broadcasting Corp.	6005, 9720	
		15425	
0200-0300	Voice of America.....	5995, 6130	
		7205, 9455	
		9575, 9650	
		9775, 11580	
		15205	
0200-0300	Voice of Asia, Taiwan.....	7285	
0200-0300	Voice of Free China, Taiwan.	5985, 9555	
		11740	
0200-0300	WHRI, Indiana.....	9690	
0200-0300	WINB, Pennsylvania.....	15145	
0200-0300 M	World Music Radio.....	6910	
0200-0300	WRNO Worldwide.....	7355	
0200-0300	WYFR, Florida.....	11805	
0215-0220	Radio Nepal.....	5005	
0215-0300	Radio Berlin International..	6080, 9730	
0230-0300	BBC, England.....	5975, 6005	
		6120, 6175	
		7325, 9515	
		9915	
0230-0300	KNLS, Alaska.....	11905	
0230-0300	Radio Netherland.....	6020, 6165	
		9590, 9895	
0230-0245	Radio Pakistan.....	5905, 7315	
		11745, 15115	
		15580, 17660	
0230-0300	Radio Sweden International..	9695,	
0230-0300	Radio Tirana Albania.....	17840 SSB	
		7060, 7120	
		9760	
0230-0300	SLBC, Sri Lanka.....	9720	
0230-0300 S,M	WINB, Pennsylvania.....	15145	
0240-0250	All India Radio.....	6110, 9545	
		9610	
0245-0300	Radio Berlin International..	6125, 6165	

0300 UTC	[10:00 PM EST/7:00 PM PST]		
0300-0310	CBC Northern Quebec Service.	6195, 9625	
0300-0315	Radio Budapest, Hungary.....	6025, 6110	
		9520, 9835	
0300-0325	Radio Netherland.....	6020, 6165	
		9590, 9895	
0300-0330	BBC, England.....	5975, 6005	
		6120, 6155	
		6175, 7160	
		7185, 7325	
		9515, 9600	
		9915	
0300-0330	Radio Berlin International..	6125, 6165	
0300-0330	Radio Cairo, Egypt.....	9475, 9675	
0300-0330	Radio Canada International..	5960, 9755	
0300-0330	Radio Japan General Service	17810, 17835	
		17845	
0300-0330	Radio Kiev, Ukrainian SSR...	6200, 9765	
		11790, 13645	
0300-0330 T-A	Radio Portugal.....	6075, 9705	
0300-0330 S,M	WINB, Pennsylvania.....	15145	
0300-0345	Radio Berlin International..	9560, 9620	
0300-0350	Deutsche Welle, West Germany	6045, 6185	
		9545, 9565	
		9640	
0300-0350	Voice of Turkey.....	9560	
0300-0400	Armed Forces Radio and TV...	6030, 11730	
		11790, 12060	
		17765, 21570	
0300-0400	CFCX, Montreal, Canada.....	6005	
0300-0400	CFRX, Toronto, Canada.....	6070	
0300-0400	CFVP, Calgary, Canada.....	6030	
0300-0400	CHNX, Halifax, Canada.....	6130	
0300-0400 TEN	Christian Science Monitor...	9745	
0300-0400	CKFX, Vancouver, Canada.....	6080	
0300-0400	HCJB, Ecuador.....	6230, 9870	
0300-0400	KCBI, Texas.....	11910	
0300-0400	KSDA, Guam (AWR).....	17840	
0300-0400	KVOH, California.....	9852.5	

0300-0400	KYOI, Saipan.....	15190	
0300-0400 M	La Voz Evangelica, Honduras..	4820	
0300-0400	Radio Australia.....	15160, 15240	
		15320, 15395	
		17715, 17750	
		17795, 11750	
		15180, 15280	
		15445	
0300-0400	Radio Beijing, China.....		
0300-0400	Radio Belize.....	3285	
0300-0400	Radio Cultural, Guatemala...	5955	
0300-0400 T-S	Radio Dublin International..	6910	
0300-0400 T-S	Radio Earth.....	7400	
0300-0400	Radio Havana Cuba.....	5965, 6035	
		6090, 6100	
		6140, 6190	
		7400, 9740	
		5915, 5940	
		6000, 6070	
		6130, 7115	
		7165, 7185	
		7310, 11770	
		12050, 13665	
0300-0400	Radio New Zealand Int'l....	11780, 15150	
0300-0400	Radio Polonia, Poland.....	6095, 6135	
		7270, 9525	
		11815	
0300-0400	Radio Prague, Czechoslovakia	5930, 7345	
0300-0400	Radio RSA, South Africa.....	3230, 4990	
		7270, 9585	
0300-0400	Radio Thailand.....	9560, 11905	
0300-0400	SLBC, Sri Lanka.....	6005, 9720	
		15425	
0300-0400	TIFC, Costa Rica.....	5055	
0300-0400	Trans World Radio, Bonaire..	9535	
0300-0400	Voice of America.....	5995, 6035	
		6130, 7280	
		9455, 9550	
		9575, 9650	
		9740, 9775	
		11580, 15205	
0300-0400	Voice of Free China, Taiwan.	5985, 9555	
		9680, 11745	
0300-0400	Voz Evangelica, Honduras....	4820	
0300-0400 M	WHRI, Indiana.....	7400	
0300-0400 M	World Music Radio.....	6910	
0300-0400	WRNO Worldwide.....	7355	
0305-0400 A	Radio Austria International.	5945, 6055	
		6155	
0310-0330	Vatican Radio.....	6150	

0315-0330	Radio France International..	6005, 60	
		6175, 71	
		9535, 96	
		9790, 98	
0330-0400 M	CBC Northern Quebec Service.	6195, 96	
0330-0400	BBC, England.....	3955, 59	
		6120, 61	
		9410, 96	
0330-0400	Radio Austria International.	6155	
0330-0400	Radio Havana Cuba.....	6090, 61	
		6140, 97	
0330-0400	Radio Sweden International.	11705	
0330-0400	Radio Tanzania.....	5985	
0330-0400	Radio Tirana Albania.....	6200, 70	
0330-0400	UAE Radio, Dubai.....	9640, 119	
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0335-0340	All India Radio.....	3905, 480	
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0340-0400	Voice of Greece.....	7430, 94	
0345-0400	Radio France International..	6175, 71	
		7175, 95	
		9800, 99	
0345-0400	Radio New Zealand Int'l....	9620, 96	
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0350-0359	Radio Yerevan, Armenian SSR	11790, 136	
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0400 UTC	[11:00 PM EST/8:00 PM PST]		
0400-0410	Voice of Kenya.....	6090	
0400-0415	Radio Budapest.....	6025, 61	
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0400-0415	Radio Cultural, Guatemala...	3300	
0400-0425	Radio Netherlands.....	7175, 98	
0400-0425	Radio RSA, South Africa.....	3230, 49	
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0400-0430	Radio Bucharest, Romania...	5990, 95	
		9570, 1181	
		11940	
0400-0430 T-A	Radio Canada Intl.....	5960, 97	
		11920	
0400-0430 M	Radio Norway International..	9590	
0400-0430	Swiss Radio International...	6135, 972	
		9885, 1203	
0400-0430	Trans World Radio, Bonaire..	9535	
0400-0430 S,M	Trans World Radio, Bonaire..	4835, 729	



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* Equipment News * Articles * and More**

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0400-0500	ABC, Perth, Australia.....	15425	0500-0550	Deutsche Welle.....	5960, 6120	0600-0700	Soloman Islands Bcating Co.	5020
0400-0500	Armed Forces Radio and TV...	6030, 12060	0500-0600	ABC, Melbourne, Australia..	15330	0600-0700	VLQ 9, Brisbane, Australia..	9660
		11730, 11790	0500-0600	ABC, Perth, Australia.....	15425	0600-0700	VLW 15, Lyndhurst,Australia	15230
0400-0500	BBC, London, England.....	3955, 5975	0500-0600	Armed Forces Radio and TV...	6030, 11790	0600-0700	VLW 15, Waneroo, Australia.	15425
		6005, 6120			15330, 11765		Voice of America.....	3990, 5995
		6175, 7105	0500-0600	CBC Northern Quebec Service.	9625			6035, 6080
		7160, 9510	0500-0600	CFCX, Montreal, Canada.....	6005			6125, 7280
0400-0500	Capital Radio, South Africa.	3927, 3930	0500-0600	CFRX, Toronto, Canada.....	6070			9530, 9550
		7149	0500-0600	CFVP, Calgary, Canada.....	6030	0600-0700	Voice of Asia, Taiwan.....	7285
0400-0500	CBC Northern Quebec Service.	6195	0500-0600	CHNX, Halifax, Canada.....	6130	0600-0700	Voice of Free China,Taiwan..	5985
0400-0500	CFCX, Montreal, Canada.....	6005	0500-0600	Christian Science Monitor...	9745	0600-0700	Voice of Malaysia.....	6175, 9750
0400-0500	CFRX, Toronto, Canada.....	6070	0500-0600	CKFX, Vancouver, Canada.....	6080			15295
0400-0500	CFVP, Calgary, Canada.....	6030	0500-0600	HCJB, Quito, Ecuador.....	6230, 9870	0600-0700	WHRI, Indiana.....	6100
0400-0500	CHNX, Halifax, Canada.....	6130			11910	0600-0700 S	World Music Radio.....	6910
0400-0500	Christian Science Monitor...	9745	0500-0600	KVOH, California.....	9852.5	0600-0700 S	WRNO Worldwide.....	6185
0400-0500	CKFX, Vancouver, Canada.....	6080	0500-0600	KYOI, Saipan.....	15190	0600-0700	WYFR, Okeechobee, Florida...	6085, 7355
0400-0500	HCJB, Ecuador.....	6230, 9870	0500-0600	Radio Australia.....	15160, 15240			7365, 7400
0400-0500	KNLS, Alaska.....	9670			15320, 15395			9455, 9680
0400-0500	KVOH, California.....	9852.5			17715, 17750			9852.5
0400-0500	Radio Australia.....	9755, 11945	0500-0600	Radio Beijing, China.....	9565	0615-0655 A.S	BRT, Belgium.....	9880, 21810
		15160, 15240	0500-0600	Radio Canada International..	6140	0615-0630 M-F	Radio Canada International..	6140, 7155
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		17715, 17795	0500-0600	Radio Havana Cuba.....	5965, 6035			11775
0400-0500	Radio Beijing.....	9645, 11980			6090, 6190	0615-0630 M-A	Vatican Radio.....	15190, 17730
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0400-0500 T-S	Radio Dublin International..	6910			17810	0630-0700	Radio Polonia.....	6135, 7270
0400-0500	Radio Havana Cuba.....	6035, 6090	0500-0600	Radio Korea World News Svc..	7275			9675
		6140, 9740	0500-0600	Radio Moscow.....	5905, 5915	0630-0700	Radio RSA, South Africa.....	5980, 7270
0400-0500	Radio Japan.....	9595, 9675			5940, 5980			9585, 11900
0400-0500	Radio Moscow.....	6130, 7155	0500-0600	Radio Uganda.....	4976, 5026	0630-0700	Radio Sofia, Bulgaria.....	9700, 11720
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		12030	0500-0600	SBC Radio 1, Singapore.....	11940	0630-0700	Radio Tirana.....	7065
0400-0500	Radio Moscow World Service.	5920, 5940	0500-0600	Soloman Islands Bcating Co	5020	0630-0700	Swiss Radio International..	3985, 6160
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		7185, 7270	0500-0600	VLW 15, Lyndhurst,Australia	15230			6205
		7310, 9635	0500-0600	VLW 15, Waneroo, Australia.	15425	0645-0700 M-F	HCJB, Quito, Ecuador.....	
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		12050, 13645			7200, 7280			
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0400-0500	Radio Pyongyang, N.Korea...	15140, 15160	0500-0600	WHRI, Indiana.....	7400	0700-0712	Radio Bucharest, Romania...	11940, 15250
		15180	0500-0600	World Music Radio.....	6910			15335, 17790
0400-0500	Radio Sofia Bulgaria.....	7115	0500-0600v M	WRNO Worldwide.....	6185	0700-0730	Burma Broadcasting Corp.....	9730
0400-0500	Radio Uganda.....	4976, 5026	0500-0600	BBC, London.....	5975, 9510	0700-0730	BBC, London.....	5950, 5970
0400-0500	RAE, Argentina.....	9690, 11710	0530-0600	Radio Cameroon.....	4850			6050, 7150
0400-0500	VLW 15, Lyndhurst,Australia	15230	0530-0600	Radio Netherlands.....	6165, 9715			7210, 9510
0400-0500	VLW 15, Waneroom, Australia	15425						15360
0400-0500	Voice of America.....	3990, 5995				0700-0730 A,S	TWR, Bonaire.....	9535
		6035, 6040				0700-0730v	Radio Zambia.....	11880v
		7170, 7280				0700-0735	TWR Swaziland.....	6070
		9575, 9670				0700-0745	Radio New Zealand Int'l....	11780, 15150
		11835, 15205				0700-0745	WYFR, Florida.....	6065, 7350
0400-0500	Voice of Turkey.....	9560						7400, 9450
0400-0500	WHRI, Indiana.....	7400				0700-0750	Radio Pyongyang.....	11930, 13750
0400-0500 S-F	WMLK, Pennsylvania.....	9455						15340
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0400-0500	WRNO Worldwide.....	6185				0700-0800	ABC Lyndwurst.....	9680
0415-0430	Radio France International..	6175, 7135	0600-0700	Armed Forces Radio and TV...	6030, 15330	0700-0800	Armed Forces Radio and TV..	15400
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0425-0450	RAI, Italy.....	5980			5900, 5975	0700-0800	CFVP, Calgary, Canada.....	6030
0430-0455	Radio Tirana Albania.....	9480, 11835			6175, 7105	0700-0800	CHNX, Halifax, Canada.....	6130
0430-0500	Deutsche Welle, W. Germany..	7150, 7225			7150, 7120	0700-0800	CKFX, Vancouver, Canada.....	6080
		9565, 9765			9510, 9600	0700-0800 A,S	ELWA, Liberia.....	11830
0430-0500	Radio Austria International.	5945, 6155			9640, 9915	0700-0800	FEBC, Manila.....	11850, 15300
		9755				0700-0800	GBC-2, Accra, Ghana.....	3366
0430-0500	Radio Berlin International..	9560, 9620	0600-0700	CFCX, Montreal, Canada.....	6005	0700-0800	HCJB.....	6130, 6200
0430-0500	Radio Truth, S. Africa.....	3370	0600-0700	CFRX, Toronto, Canada.....	6070			9745, 9800
0430-0500	TWR, Swaziland.....	7210	0600-0700	CFVP, Calgary, Canada.....	6030			9860, 11700
0445-0500	Radio France International..	6055, 6175	0600-0700	CKFX, Vancouver, Canada.....	6080			
		7135, 9535	0600-0700	CHNX, Halifax, Canada.....	6130	0700-0800	King of Hope, Lebanon.....	6280
		9550, 9790	0600-0700 TEN	Christian Science Monitor...	7365	0700-0800	KVOH, California.....	6005
		9800	0600-0700	GBC-2, Accra, Ghana.....	3366	0700-0800	KNLS, Anchor Point, Alaska..	9555
			0600-0700	HCJB, Quito, Ecuador.....	6230, 9870	0700-0800	KYOI, Saipan.....	15190
			0600-0700	King of Hope, Lebanon.....	6280	0700-0800	NBC, Papua New Guinea.....	4890
			0600-0700	KVOH, California.....	6005	0700-0800	Radio Australia.....	5995, 9600
			0600-0700	KYOI, Saipan.....	15190	0700-0800 S	Radio Earth (via Milano)....	7295
			0600-0700	Radio Australia.....	15160, 15240	0700-0800	Radio Havana Cuba.....	9525
					17715, 17750	0700-0800	Radio Japan General Service.	9675, 9700
					17795			11955, 15200
					11760			17810, 17850
			0600-0700	Radio Cook Islands.....	9525	0700-0800	Radio Kuwait.....	9560
			0600-0700	Radio Havana Cuba.....	9570, 7275	0700-0800	Radio Moscow.....	7165, 7200
			0600-0700	Radio Korea, South.....	5905, 5915			17590, 17650
			0600-0700	Radio Moscow.....	5940, 5980	0700-0800	Radio Thailand.....	9655, 11600
					7175, 7310	0700-0800	SBC Radio 1, Singapore.....	5010, 11650
					7270, 7300	0700-0800	Soloman Islands Bcating Svc	5020
					9490, 9635	0700-0800	VLW4 Brisbane, Australia....	4920
					9580, 9755	0700-0800	Voice of America.....	3990, 5995
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					12030, 13605			6125, 7280
0500-0530	Capital Radio, S. Africa....	3927.5	0600-0700	Radio New Zealand Int'l....	11780			9530, 9580
0500-0530	KNLS, Alaska.....	9670	0600-0700	Radio Pyongyang, N. Korea..	13650, 13680			9550, 9600
0500-0530	Radio Canada Int'l.....	11840	0600-0700 S	Radio Zambia.....	11880			11840
0500-0530 M	Radio Norway International.	15180, 15165	0600-0700	SBC Radio 1, Singapore.....	11940	0700-0800	Voice of Free China.....	5985
0500-0530 S,M	Trans World Radio, Bonaire..	9535						

frequency SECTION

0700-0800 Voice of Malaysia..... 6175, 9750
 0700-0800 Voice of Nigeria..... 15295, 15120, 15185, 17800
 0700-0800 WHRI, Indiana..... 9620
 0700-0800 S World Music Radio..... 6910
 0700-0800 S WRNO Worldwide..... 6185
 0715-0730 M-A Vatican Radio..... 11725, 15190
 0715-0800 S FEBA Radio, Seychelles..... 15120, 17795
 0725-0800 TWR Monte Carlo..... 7105
 0730-0735 All India Radio..... 5990, 6010, 6020, 6050, 7110, 7250, 9610, 11730, 11850, 11935

0730-0800 BBC, London..... 9510, 9600, 9600, 9640, 11860, 11330
 0730-0800 S CPBS, China..... 15115
 0735-0800 M-H KTWR, Guam..... 6120, 11755
 0730-0800 Radio Finland..... 15265
 0730-0800 Radio Netherlands..... 9630, 9715
 0730-0800 Radio Prague..... 11855, 17840, 21705

0800 UTC [3:00 AM EST/12:00 AM PST]

0800-0805 GBC, Accra, Ghana..... 3366
 0800-0825 M-F BRT, Belgium..... 9880, 17595
 0800-0825 Radio Netherlands..... 9630, 9715
 0800-0825 Voice of Malaysia..... 6175, 9750
 0800-0830 Voice of Islam, Bangladesh.. 11645, 12030
 0800-0830 HCJB, Quito, Ecuador..... 6130, 6205, 9745, 9660
 0800-0830 Voice of Nigeria..... 7255, 15185
 0800-0845 S FEBA, Seychelles..... 15120, 17795
 0800-0900 AFAN, Antarctica..... 6012
 0800-0900 AFRTS Far East Network..... 11750
 0800-0900 BBC, London..... 9410, 9510
 0800-0900 S BBS, Bhutan..... 6035
 0800-0900 CFCX, Montreal, Canada..... 6005
 0800-0900 CFRX, Toronto, Canada..... 6070
 0800-0900 CFVP, Calgary, Canada..... 6030
 0800-0900 CHNX, Halifax, Canada..... 6130
 0800-0900 CKFX, Vancouver, Canada..... 6080
 0800-0900 FEBC, Manila..... 6030, 11890, 21475
 0800-0900 FEN, Tokyo..... 3910, 6155
 0800-0900 S,A GBC-2, Accra, Ghana..... 3366
 0800-0900 HCJB, Quito, Ecuador..... 6130, 9745
 0800-0900 King of Hope, Lebanon..... 6280
 0800-0900 KNLS, Anchor Point, Alaska.. 5960
 0800-0900 M-H KTWR, Guam..... 15515
 0800-0900 KYOI, Saipan..... 15190
 0800-0900 Radio Australia..... 5995, 6080, 9580, 9655, 9710, 15395, 11720, 17715, 17750

0800-0900 Radio Earth (via Milan)..... 7295
 0800-0900 Radio Korea World News Svc.. 7275
 0800-0900 Radio Kuwait..... 9750
 0800-0900 S Radio Prague..... 6055, 9505, 11990

0800-0900 Radio Pyongyang, N. Korea.. 13680, 11830, 15160, 15180
 0800-0900 RTE Portugal..... 9670
 0800-0900 SBC Radio 1, Singapore..... 5010, 11940
 0800-0900 TWR Monte Carlo..... 7105
 0800-0900 Voice of Indonesia..... 11790, 15150
 0800-0900 WHRI, Indiana..... 7355
 0800-0900 S WRNO Worldwide..... 6185
 0830-0900 Radio Austria Int'l..... 7210, 11840
 0830-0900 Radio Beijing..... 9700, 11755, 15440

0830-0900 Radio Prague, Czechoslovakia 11855, 17840, 21705
 0830-0840 All India Radio..... 5960, 5970, 5990, 6010, 6020, 6050, 6100, 7110, 7125

0830-0855 M-A Radio Netherlands..... 9630
 0830-0900 HCJB, Quito, Ecuador..... 6130, 9745, 11925
 0830-0900 Radio Netherlands..... 17575, 21485
 0830-0900 Swiss Radio International... 9560, 9885, 11905, 15570

0840-0900 Radio Australia..... 6045, 6060, 9580, 15395
 0847-0852 A R. Pacific Ocean, Vladivost. 9500, 9620, 9635, 9795, 9810, 11710, 11815, 11910

0900 UTC [4:00 AM EST/1:00 AM PST]

0900-0905 Africa Number One, Gabon.... 7200, 15200
 0900-0915 BBC, London..... 9410, 9510, 9750, 11750, 11860
 0900-0925 Radio Netherlands..... 17575, 21485
 0900-0930 Radio Australia..... 5995, 6080, 9580, 9655, 9710, 11720
 0900-0930 Radio Korea..... 7275
 0900-0950 Radio Pyongyang N. Korea.... 9765, 11830, 13650
 0900-1000 ABC, Brisbane, Australia.... 4920, 9660
 0900-1000 S Adventist World Radio..... 9670
 0900-1000 AFRTS..... 6030, 6125, 9530, 9590, 9700

0900-1000 Deutsche Welle..... 9690, 11945, 15160, 15185, 15205, 15320, 17780, 17800, 21560
 0900-1000 FEBC, Manila..... 11890, 21475
 0900-1000 FEN, Tokyo..... 6155
 0900-1000 HCJB, Quito, Ecuador..... 6130, 9745
 0900-1000 King of Hope, Lebanon..... 6280
 0900-1000 KNLS, Anchor Point, Alaska.. 11850
 0900-1000 KSDA, Guam..... 15440
 0900-1000 Radio Afghanistan..... 6085, 9590, 15255, 17655

0900-1000 Radio Japan..... 9675, 11875, 11955, 15235, 17810

0900-1000 Radio Moscow..... 9795
 0900-1000 Radio New Zealand Int'l.... 9600, 11780
 0900-1000 Radio Tanzania..... 9685v
 0900-1000 S Radio Prague..... 6055, 9505, 11990

0900-1000 SBC Radio 1, Singapore..... 5010, 11940
 0900-1000 Voice of Nigeria..... 7255, 15120, 15185, 17800

0900-1000 WHRI, Indiana..... 7355
 0900-1000 S WRNO Worldwide..... 6185
 0915-1000 BBC, London..... 9760, 9750, 11750

0930-1000 Radio Australia..... 9580, 9655, 9710

1000 UTC [5:00 AM EST/2:00 AM PST]

1000-1010 Voice of Kenya..... 9665
 1000-1030 Afghanistan..... 6085, 9590, 15255, 17655, 7225, 9735

1000-1030 Deutsche Welle, W. Germany.. 17765, 21600
 1000-1030 Kol Israel..... 11700, 13725, 15640, 15650, 17565, 17685, 17815

1000-1030 Radio Australia..... 9580, 9655, 9770

1000-1030 S Radio Norway International.. 9590, 15175, 15185, 15230

1000-1030 Swiss Radio Int'l..... 9560, 9885, 11905, 15570

1000-1030 Voice of Vietnam..... 9755, 9765, 12035

1000-1100 AFRTS..... 6030, 6125, 9530, 9590, 9700, 11805

1000-1100 All India Radio..... 11705, 11810, 15320, 15335

1000-1100 BBC, London..... 17387, 17875, 6195, 9410, 9740, 9760, 11750, 12095, 15070, 15280, 21660

1000-1100 B.S. Kingdom Saudi Arabia.. 11855v
 1000-1100 CFCX, Montreal, Canada..... 6005
 1000-1100 CFRX, Toronto, Canada..... 6070
 1000-1100 CFVP, Calgary, Canada..... 6030
 1000-1100 CHNX, Halifax, Canada..... 6130
 1000-1100 CKFX, Vancouver, Canada.... 6080
 1000-1100 FEN, Japan..... 3910, 6155
 1000-1100 HCJB, Quito, Ecuador..... 6130, 11925
 1000-1100 KNLS, Alaska..... 5960
 1000-1100 Radio Dubai, UAE..... 17775
 1000-1100 Radio Honaire, Soloman IIs.. 5020

1000-1100 Radio Moscow..... 9600, 9
 1000-1100 S Radio Prague..... 6055, 9, 11990
 1000-1100 SBC Radio 1, Singapore..... 5052, 11
 1000-1100 Voice of Nigeria..... 7255, 15
 1000-1100 WHRI, Indiana..... 7355
 1000-1100 S WRNO Worldwide..... 6185
 1005-1010 Radio Pakistan..... 15605, 17
 1030-1040 Voice of Asia, Taiwan..... 5980
 1030-1100 Radio Austria International. 9625, 12
 1030-1100 Radio Australia..... 15270, 9580
 1030-1100 Radio Budapest Hungary..... 9835, 11
 1030-1100 Radio Netherlands..... 15160, 15
 1030-1100 Radio New Zealand..... 17710, 21
 1030-1100 Sri Lanka Broadcasting Corp 11835, 15
 1030-1100 UAE Radio, Dubai..... 17755, 17
 1040-1050 Vatican Radio..... 21605, 21
 1040-1050 Voice of Greece..... 11740
 1045-1000 Radio Nepal..... 15630, 17
 1050-1100 M-F Radio Budapest Hungary..... 5005, 9
 11910, 151
 17710

1100 UTC [6:00 AM EST/3:00 AM PST]

1100-1115 Radio Pakistan..... 15605, 176
 1100-1125 Radio Netherlands..... 6020, 96
 1100-1130 Kol Israel..... 11605, 156
 1100-1130 Radio Australia..... 15560, 156
 1100-1130 Radio Finland..... 5995, 60
 1100-1130 Radio Japan..... 7215, 95
 1100-1130 Radio Sweden Int'l..... 9710, 97
 1100-1130 Sri Lanka Broadcasting Corp 11945, 154
 1100-1130 Swiss Radio International.. 9630, 151
 1100-1130 Voice of America..... 9630, 151
 1100-1130 Voice of Vietnam..... 11835, 151
 1100-1130 Voice of Vietnam..... 17850, 9655, 98
 1100-1130 Radio RSA, South Africa.... 11795, 155
 1100-1130 Voice of America..... 6110, 97
 1100-1130 Voice of Vietnam..... 15160, 152
 1100-1156 Radio RSA, South Africa.... 15425, 9755, 97
 1100-1200 4VEH, Haiti..... 12035
 1100-1200 ABC, Brisbane, Australia.... 11900, 152
 1100-1200 ABC, Perth, Australia..... 17780, 4930
 1100-1200 AFRTS..... 4920
 1100-1200 B.S. Kingdom Saudi Arabia.. 9610
 1100-1200 CFCX, Montreal, Canada..... 6030, 95
 1100-1200 CFRX, Toronto, Canada..... 9700, 118
 1100-1200 CFVP, Calgary, Canada..... 15430
 1100-1200 CHNX, Halifax, Canada..... 5965, 61
 1100-1200 CKFX, Vancouver, Canada.... 9410, 95
 1100-1200 Radio Japan General Service. 9740, 97
 1100-1200 Radio Korea..... 11750, 117
 1100-1200 Radio Malaysia, Sarawak.... 12095, 150
 1100-1200 Radio Moscow..... 15280, 11855v
 1100-1200 CFCX, Montreal, Canada..... 6005
 1100-1200 CFRX, Toronto, Canada..... 6070
 1100-1200 CFVP, Calgary, Canada..... 6030
 1100-1200 CHNX, Halifax, Canada..... 6130
 1100-1200 CKFX, Vancouver, Canada.... 6080
 1100-1200 Radio Japan General Service. 9535
 1100-1200 Radio Korea..... 9675, 118
 1100-1200 Radio Malaysia, Sarawak.... 7275, 155
 1100-1200 Radio Moscow..... 4950, 9600, 97
 1100-1200 Radio New Zealand..... 11675, 136
 1100-1200 Radio Pyongyang, N. Korea.. 13680, 137
 1100-1200 SBC Radio 1, Singapore..... 15135, 151
 1100-1200 Trans World Radio Bonaire.. 15475, 155
 1100-1200 Voice of Asia, Taiwan..... 6100, 96
 1100-1200 Voice of Nigeria..... 7300, 97
 1100-1200 WHRI, Indiana..... 9977, 5052, 119
 1100-1200 Trans World Radio Bonaire.. 11815
 1100-1200 Voice of Asia, Taiwan..... 5980, 74
 1100-1200 Voice of Nigeria..... 7255, 151
 1100-1200 WHRI, Indiana..... 5995

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1100-1200 S	WRNO Worldwide.....	6185
1115-1130	Vatican Radio.....	17840, 21485
1115-1200	Voice of Islamic Rep. Iran.	11790, 15084
1130-1200	Radio Australia.....	5995, 6060
		6080, 7215
		9580, 9645
		9710, 9770
		11800
1130-1200	Radio Japan.....	5960, 9755
1130-1200	Radio Netherland.....	5955, 9715
		15560, 17575
		17605, 21480
1130-1200	Radio Thailand.....	9655, 11905
1130-1200	TWR Bonaire.....	11815
1150-1200 M-F	Radio Budapest Hungary.....	6025, 9585
		9835, 11910
		15160, 17710

1200 UTC [7:00 AM EST/4:00 AM PST]

1200-1210	Voice of Is.Rep.of Iran....	15084
1200-1215	Radio New Zealand.....	6100, 9620
1200-1215 M-A	Vatican Radio.....	15190, 17840
		17865, 21485
1200-1215 S	Vatican Radio.....	17840, 21485
1200-1215	Voice of People of Kampuchea	9693, 11938
1200-1215	Radio Finland.....	11945, 15400
1200-1225	Radio Bucharest, Romania....	9530, 11740
		15345
1200-1225	Radio Netherland.....	5955, 9715
		15560, 17575
		17605, 21480
1200-1225	Radio Polonia.....	6095, 7285
1200-1230	HCJB, Quito, Ecuador.....	6075
1200-1230	Radio Tashkent.....	7325, 9600
		9715, 15460
1200-1235	All India Radio.....	3905, 4800
		4920, 7280
		9565, 9615
		11620, 15245
1200-1235	Radio Ulan Bator Mongolia...	12015
1200-1242	Trans World Radio Bonaire...	11815
1200-1250	Radio Pyongyang, N. Korea...	9715
1200-1300	4VEH, Haiti.....	4930
1200-1300	ABC, Wanneroo, Australia....	6140, 9610
1200-1300	ABC, Brisbane.....	4920
1200-1300	AFRTS.....	6030, 6125
		9700, 15330
		15430, 21670
1200-1300	BBC, London.....	5965, 6195
		9510, 9740
		9750, 11710
		11750, 11775
		12095, 15070
		17790, 21710
1200-1300	B.S. Kingdom Saudi Arabia...	11855v
1200-1300	CBC Northern Quebec Service.	6065, 9625
1200-1300	CFCX, Montreal, Canada.....	6005
1200-1300	CFRX, Toronto, Canada.....	6070
1200-1300	CFVP, Calgary, Canada.....	6030
1200-1300	CHNX, Halifax, Canada.....	6130
1200-1300	CKFX, Vancouver, Canada....	6080
1200-1300	FEN, Tokyo.....	3910, 6155
1200-1300	GBC, Accra, Ghana.....	7295
1200-1300	HCJB, Quito, Ecuador.....	11740, 11745
		15115, 17890
1200-1300	KYOI, Saipan.....	11900
1200-1300	Pt Moresby, Papua New Guinea	4890
1200-1300	Radio Australia.....	5995, 6060
		6080, 9580
		7215, 9580
		9770
1200-1300	Radio Beijing.....	9535, 9645
1200-1300	Radio Korea World News Svc..	7275
1200-1300	Radio Moscow.....	6000, 9575
		9820, 11675
		13615, 13665
		13790, 15155
		15225, 15475
		15595, 17645
		17655, 17820
1200-1300	Radio Tanzania.....	9685
1200-1300	RAE, Argentina.....	15345
1200-1300	SBC Radio 1, Singapore.....	5010, 5052
		11940
1200-1300	Voice of America.....	6110, 9760
		11715, 15430
		17790
1200-1300	WHRI, Indiana.....	5995
1200-1300 S	WRNO Worldwide.....	9715
1200-1300	WYFR, Florida.....	5985, 9680
		11875
1210-1300	Voice of Nigeria.....	7255, 15120
1215-1300	Radio Cairo.....	17675
1215-1245	Radio Japan Regional Serv..	11875, 15235

1215-1300	Radio Berlin International.	21465, 21540
1215-1230	Voice of Islamic Rep. Iran.	11895, 15085
1230-1300	Radio Austria International	15320
1230-1300	Radio Australia.....	15320, 17655
		17800
1230-1300	Radio Bangladesh.....	15525, 17653
		21630
1230-1300	R. Berlin Intl., E. Germany	15240
1230-1300	Radio Polonia.....	15190, 15430
1230-1300	Radio Sweden Intl.....	9565, 11735
1230-1300	TES Radio Veritas, Philippines.	6160
1230-1300	Sri Lanka Broadcasting Corp.	6075, 9720
		15425
1230-1300	Voice of Turkey.....	15255
1230-1300	WYFR, Florida.....	9680
1235-1245	Voice of Greece.....	11645, 15360
		15630, 17565
1245-1300	Radio Berlin Intl.....	15240
1255-1300 M-A	Radio Ulan Bator Mongolia...	7235, 9575
		15305
1255-1300 A-S	TWR, Bonaire.....	11815

1300 UTC [8:00 AM EST/5:00 AM PST]

1300-1325	Radio Canada International.	9715, 11955
		11855
		15440, 17820
1300-1330	BBC, London.....	5965, 6195
		9410, 9510
		9740, 9750
		11705, 11775
		12095, 15070
		15105, 17085
		17705, 17790
		21710
1300-1330	Radio Australia.....	6080, 7205
		9580
1300-1330	Radio Berlin Intl.....	15240
1300-1330	Radio Bucharest, Romania....	9690, 11940
		15250
1300-1330	Radio Finland.....	15400, 11945
1300-1330	Radio Korea.....	6135
1300-1330 S	Radio Norway International.	15310, 15185
1300-1337 A-S	TWR, Bonaire.....	11815
1300-1350	Radio Pyongyang, N. Korea...	9345, 11665
1300-1355 S	Radio Finland.....	11945, 15400
1300-1400	4VEH, Haiti.....	4930
1300-1400	ABC Wanneroo, Australia....	6140, 9610
1300-1400	AFRTS.....	6125, 9700
		15330, 15430
1300-1400	B.S. Kingdom Saudi Arabia...	11855v
1300-1400	CBC Northern Quebec Service	9625, 11720
1300-1400	CFCX, Montreal, Canada.....	6005
1300-1400	CFRX, Toronto, Canada.....	6070
1300-1400	CFVP, Calgary, Canada.....	6030
1300-1400	CHNX, Halifax, Canada.....	6130
1300-1400	CKFX, Vancouver, Canada....	6080
1300-1400	CKZU, Vancouver, Canada....	6160
1300-1400	FEBC, Manila.....	11850
1300-1400	FEN, Tokyo.....	6155
1300-1400	GBC, Accra, Ghana.....	7295
1300-1400	HCJB, Quito, Ecuador.....	11745, 15115
		17890
1300-1400 M-F	KTWR, Guam.....	9870
1300-1400	NBC, Port Moresby, Papua	
	New Guinea.....	4890
1300-1400	Radio Australia.....	5995, 6060
		6080, 9580
1300-1400	Radio Beijing.....	4460, 5320
		5860, 5880
		9550, 9730
		11660, 11755
1300-1400	Radio Moscow.....	7230, 9575
		9755, 9820
		11900, 13665
		13790, 15210
		15225, 15475
		15530, 15595
		17655, 17665
		17820
1300-1400	Radio RSA, South Africa....	15220, 21535
		21590
1300-1400 TES	Radio Veritas, Philippines...	6160
1300-1400	SBC Radio 1, Singapore.....	5010, 5052
		11940
1300-1400	Sri Lanka Broadcasting Corp.	6075, 9720
		15425
1300-1400	Voice of America.....	6110, 7230
		9660, 9760
		15205
1300-1400	Voice of Nigeria.....	7255, 15120
1300-1400	WHRI, Indiana.....	11790
1300-1400 S	WRNO Worldwide.....	9715
1300-1400	WYFR, USA.....	5985, 9680
		11830, 11875

1330-1400	All India Radio.....	11810, 15335
1330-1400	Laotian National Radio.....	7113v
1330-1400	BBC, London.....	9750, 9760
		12095, 15070
		17885, 21710
1330-1400 M-A	BBS, Bhutan.....	6035
1330-1400	Radio Berlin Intl.....	21465
1330-1400	Radio Korea World News Svc.	15575
1330-1400	Radio Tashkent.....	7325, 9715
		15460
1330-1400	Swiss Radio International..	9730, 9885
		11905, 11955
		12030, 15570
		15585
1330-1400	U.A.E. Radio.....	11940, 17775
		17865, 21605
1330-1400	Voice of Vietnam.....	9840, 15010v
1330-1400	WYFR, Florida.....	15055
1330-1355 M-F	BRT, Belgium.....	15580, 15590
1330-1445	BBS, Burma.....	4725
1337-1400 A	TWR, Bonaire.....	11815
1345-1400	Vatican Radio.....	7250, 9645
		11740

1400 UTC [9:00 AM EST/6:00 AM PST]

1400-1415	GBC-2, Accra, Ghana.....	7295
1400-1415	Radio Berlin International.	21465
1400-1415	U.A.E. Radio, Dubai.....	11940, 17775
		17865, 21605
1400-1430	Radio Australia.....	5995, 6035
		6045, 6065
		6080, 9580
		9710
1400-1430	Radio Finland.....	11945, 15400
1400-1430	Radio Japan General Service.	5990, 7140
		9675, 9695
		11815
1400-1430 S	Radio Norway International.	9530, 15310
1400-1430	Radio Polonia.....	6095, 7280
1400-1430	Radio Sweden International.	9690, 15340
1400-1430	Radio Tirana.....	9500, 11980
1400-1430 S	WRNO, Worldwide.....	9715
1400-1500	AFRTS.....	9700, 11800
		15330, 15430
1400-1500	All India Radio.....	11810, 15330
1400-1500	BBC, London.....	7105, 9740
		9750, 9760
		12095, 15070
		17705, 17790
		17885
1400-1500	CBC Northern Quebec Service.	9625, 11720
1400-1500	CFCX, Montreal, Canada.....	6005
1400-1500	CFRX, Toronto, Canada.....	6070
1400-1500	CFVP, Calgary, Canada.....	6030
1400-1500	CHNX, Halifax, Canada.....	6130
1400-1500	CKFX, Vancouver, Canada....	6080
1400-1500	FEBC, Manila.....	9665, 11810
1400-1500	HCJB, Quito, Ecuador.....	11740, 11745
		15115, 17890
1400-1500	Kuching, Sarawak, Malaysia	4950
1400-1500	KVOH, California.....	11940
1400-1500	Radio Beijing.....	11600, 15115
1400-1500 S	Radio Canada International.	11955, 17820
		15440
1400-1500	Radio Korea, South.....	9570, 9715
		15575
1400-1500	Radio Moscow.....	6020, 6035
		7160, 7210
		9820, 11710
		11840, 13615
		13790, 15210
		15320, 15475
		15585, 15595
		17665, 17820
		17850
1400-1500	Radio Pyongyang, N. Korea....	9555, 9715
1400-1500	Radio RSA, South Africa....	21590
1400-1500	Radio Veritas, Philippines	6160
1400-1500	SBC Radio 1, Singapore.....	5010, 5052
		11940
1400-1500	Sri Lanka Broadcasting Corp.	6075, 9715
		15425
1400-1500	WHRI, Indianapolis.....	11790
1400-1500	WYFR, USA.....	9680, 11875
		11875
1400-1500	Voice of America.....	6110, 7230
		9760, 11715
		7255, 15120
1400-1500	Voice of Nigeria.....	7255, 15120
1415-1430 A,S	KTWR, Guam.....	9870
1415-1500 S,A	GBC-2, Accra, Ghana.....	3366
1415-1500	Radio Berlin Intl.....	11795, 15430
		17700

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1430-1500	Radio Australia.....	5995, 6045 6060, 6035 6080, 7205 9580		1600 UTC	[11:00 AM EST/8:00 AM PST]		1700-1800	CFRX, Toronto, Canada.....	6070
1430-1500 M-A	Radio Budapest Hungary.....	9835, 11910 15160, 15220 17710, 21665		1600-1605	SBC Radio 1, Singapore.....	11940	1700-1800	CFVP, Calgary, Canada.....	6030
1430-1500	Radio Korea World News Svc..	7275, 11805		1600-1615	Radio Pakistan.....	9645, 11615 11675, 11735 11925, 15515 15595, 17660	1700-1800	CHNX, Halifax, Canada.....	6130
1430-1500	Radio Netherland.....	5955, 11735 13770, 15560 17575		1600-1630	Radio Berlin Int'l.....	15255	1700-1800 S	CKFX, Vancouver, Canada.....	6080
1430-1500	Radio Yugoslavia.....	9620, 15240		1600-1630 S	Radio Norway International..	9590, 15310 6135, 9540	1700-1800	CKZU, Vancouver, Canada.....	6160
1430-1500	WRNO, Worldwide.....	11965		1600-1630 M-F	Radio Poland.....	15105, 15330	1700-1800	KCBI, Texas.....	11735
1448-1455	Radio Vatican.....	15090		1600-1630	Radio Portugal.....	11705	1700-1800	KNLS, Alaska.....	7355
1445-1500	Radio Ulan Bator, Mongolia..	9575		1600-1630	Radio Sweden Int'l.....	9840, 15010 3200	1700-1800	KVOH, California.....	17775
				1600-1645	Voice of Vietnam.....	9700, 11805 15330, 15430 9410, 9515 11705, 12095 15070, 15260 15400, 17705 17880	1700-1800	KYOI, Saipan.....	9665
				1600-1700	TWR, Swaziland.....	9700, 11805 15330, 15430 9410, 9515 11705, 12095 15070, 15260 15400, 17705 17880	1700-1800	Radio Beijing.....	9570, 11600
					AFRTS.....	9700, 11805 15330, 15430 9410, 9515 11705, 12095 15070, 15260 15400, 17705 17880	1700-1800	Radio Korea, South.....	5975, 1557
					BBC, London.....	9700, 11805 15330, 15430 9410, 9515 11705, 12095 15070, 15260 15400, 17705 17880	1700-1800	Radio Moscow.....	9470, 9495
1500 UTC	[10:00 AM EST/7:00 AM PST]						1700-1800 MWF	Radio Nacional, Eq. Guinea	9535
1500-1505 M-F	Africa #1, Gabon.....	15200					1700-1800	Radio Nacional Angola.....	7245, 953
1500-1520	Radio Ulan Bator Mongolia...	9615, 12015							11955
1500-1525	Radio Finland.....	15400, 17785		1600-1700 A	CBC Northern Quebec Service.	9625, 11720	1700-1800	Radio Pyongyang, N. Korea...	7105, 720
1500-1530	HCJB, Quito, Ecuador.....	11740, 11745 15115, 17890		1600-1700	CFCX, Montreal, Canada.....	6005	1700-1800		7305, 932
1500-1530	Radio Bucharest.....	11940, 15250		1600-1700	CHNX, Halifax, Canada.....	6130	1700-1800	Radio Riyadh, Saudi Arabia..	9720v
1500-1530	Radio Netherland.....	15335 5955, 11735 13770, 15560 17575		1600-1700	CFRX, Toronto, Canada.....	6070	1700-1800	Radio Tanzania.....	6105
1500-1530	Radio Veritas, Philippines..	9565, 15120		1600-1700	CFVP, Calgary, Canada.....	6030	1700-1800	Radio Zambia.....	9505
1500-1530	TWR, Guam.....	9870		1600-1700	CKFX, Vancouver, Canada.....	6080	1700-1800	Voice of Africa, Egypt.....	15255
1500-1530	Voice of Nigeria.....	7255, 11770		1600-1700	KVOH, California.....	17775	1700-1800	Voice of America.....	11760, 1541
1500-1550	Deutsche Welle.....	15135, 17825		1600-1700	KYOI, Saipan.....	9665	1700-1800		15445, 1557
1500-1556	Radio RSA, South Africa.....	21590		1600-1700	Radio Australia.....	6035, 6060 6080, 9550 9580, 15320	1700-1800		15580, 1560
1500-1600	AFRTS.....	9700, 11805 15330, 15430 9410, 9515 15070, 15260 15390, 17885 21710		1600-1700	Radio Beijing.....	9570, 11600 11955, 15440 17820	1700-1800		17785, 1780
1500-1600	BBC, London.....	9410, 9515 15070, 15260 15390, 17885 21710		1600-1700	Radio Canada International.	6175, 9860 11705, 15315 17620 9560	1700-1800		17870
1500-1600	CBC Northern Quebec Service.	9625, 11720		1600-1700	Radio Jordan.....	9560	1700-1800		11770
1500-1600	CFCX, Montreal, Canada.....	6005		1600-1700	Radio Korea.....	5975, 9870 3380, 5995	1700-1800		15105
1500-1600	CFRX, Toronto, Canada.....	6070		1600-1700	Radio Malawi.....	9895, 11840 11990, 13715 15110, 17705	1700-1800		15295
1500-1600	CFVP, Calgary, Canada.....	6030		1600-1700	Radio Moscow.....	9895, 11840 11990, 13715 15110, 17705	1700-1800		9455
1500-1600	CKFX, Vancouver, Canada.....	6080		1600-1700	Radio Prague, Czech.....	11990, 13715 15110, 17705	1700-1800		15420
1500-1600	CHNX, Halifax, Canada.....	6130		1600-1700	Radio Riyadh, Saudi Arabia..	9720v	1700-1800		11830, 1187
1500-1600	FEBC, Manila.....	9670		1600-1700	Radio Tanzania.....	6105	1700-1800		15170, 1775
1500-1600	KVOH, California.....	11940		1600-1700	Radio Zambia.....	9505	1700-1800		15070
1500-1600	Radio Australia.....	5995, 6030 6060, 6080 6035, 7205 9580		1600-1700	UAE Radio.....	9640, 11955 15320, 1435 6110, 9575 9760, 15205 15410, 15445 15580, 15600 17785, 17800 17870	1700-1800		15400
1500-1600	Radio Canada International.	11955, 15440 17820		1600-1700	Voice of America.....	6110, 9575 9760, 15205 15410, 15445 15580, 15600 17785, 17800 17870	1700-1800		15400
1500-1600	Radio Japan General Service.	5990, 9695 17785		1600-1700	Voice of Asia.....	5980, 7445 7255, 11770	1700-1800		15400
1500-1600	Radio Moscow.....	9895, 11705 11840, 13790 15475		1600-1700	Voice of Nigeria.....	5980, 7445 7255, 11770	1700-1800		15400
1500-1600	RTM, Sarawak, Malaysia.....	4950		1600-1700	WHRI, Indiana.....	15105 15170, 15420 15440, 11830 11875, 17645 17845, 21525 4820, 7255	1700-1800		15400
1500-1600	SBC Radio 1, Singapore.....	5010, 5052 11940		1600-1700	WRNO Worldwide.....	15170, 15420 15440, 11830 11875, 17645 17845, 21525 4820, 7255	1700-1800		15400
1500-1600	Sri Lanka Broadcasting Corp.	6075, 9720		1600-1700	WYFR, Florida.....	11875, 17645 17845, 21525 4820, 7255	1700-1800		15400
1500-1600	Voice of America.....	15425 9535 LSB 6110, 15205		1600-1700		11875, 17645 17845, 21525 4820, 7255	1700-1800		15400
1500-1600	Voice of Nigeria.....	7255, 11770		1600-1700		11875, 17645 17845, 21525 4820, 7255	1700-1800		15400
1500-1600	Voice of Indonesia.....	11790, 15150		1600-1700		11875, 17645 17845, 21525 4820, 7255	1700-1800		15400
1500-1600	V. Revolutionary Ethiopia..	9560		1600-1700		11875, 17645 17845, 21525 4820, 7255	1700-1800		15400
1500-1600	WHRI, Indiana.....	15105		1600-1700		11875, 17645 17845, 21525 4820, 7255	1700-1800		15400
1500-1600	WRNO Worldwide.....	11965		1600-1700		11875, 17645 17845, 21525 4820, 7255	1700-1800		15400
1513-1600 F-S	FEBC, Seychelles.....	11820		1600-1700		11875, 17645 17845, 21525 4820, 7255	1700-1800		15400
1515-1600	Radio Berlin Int'l.....	15240		1600-1700		11875, 17645 17845, 21525 4820, 7255	1700-1800		15400
1530-1545	Radio Bangladesh.....	7195		1600-1700		11875, 17645 17845, 21525 4820, 7255	1700-1800		15400
1530-1600 M-A	Radio Budapest Hungary.....	9835, 11910 15160, 15220 17710, 21665		1600-1700		11875, 17645 17845, 21525 4820, 7255	1700-1800		15400
1530-1600	R. Prague, Czechoslovakia..	9735, 11690 11990, 13715 17705, 17840 21505		1600-1700		11875, 17645 17845, 21525 4820, 7255	1700-1800		15400
1530-1600	Radio Yugoslavia.....	9620, 15240		1600-1700		11875, 17645 17845, 21525 4820, 7255	1700-1800		15400
1530-1600	Swiss Radio International..	9735, 11690 15430		1600-1700		11875, 17645 17845, 21525 4820, 7255	1700-1800		15400
1530-1600	Voice of Asia, Taiwan.....	5990, 7445		1600-1700		11875, 17645 17845, 21525 4820, 7255	1700-1800		15400
1530-1600	WYFR, USA.....	9680, 11830 11875, 15170 11645, 15630		1600-1700		11875, 17645 17845, 21525 4820, 7255	1700-1800		15400
1540-1550	Voice of Greece.....	17565		1600-1700		11875, 17645 17845, 21525 4820, 7255	1700-1800		15400
1545-1600	Vatican Radio.....	11810, 15090 17730		1600-1700		11875, 17645 17845, 21525 4820, 7255	1700-1800		15400
				1700 UTC	[12:00 PM EST/9:00 AM PST]		1800 UTC	[1:00 PM EST/10:00 AM PST]	
				1700-1710	Voice of Lebanon.....	6548	1800-1810	Voice of Kenya.....	6135
				1700-1720	Radio Netherland.....	9515, 15570 9515, 11775 12095, 15070 15260, 15400 17880	1800-1815	Kol Israel.....	9385, 986 11655, 1374 4750, 4790
				1700-1730	BBC, England.....	9515, 11775 12095, 15070 15260, 15400 17880	1800-1815	Radio Cameroon.....	4850, 5010 9745
							1800-1830	AWR, Italy.....	6205
							1800-1830	Radio Berlin Int'l.....	9730
							1800-1830	Radio Canada International.	15260, 1782
							1800-1830	Radio Japan.....	7250, 967
							1800-1830	Radio Mozambique.....	3340, 9620
							1800-1830	Swiss Radio Int'l.....	9535
							1800-1830	TWR, Monte Carlo.....	11965
							1800-1830	Voice of Africa, Egypt.....	15255
							1800-1830	Voice of Vietnam.....	12020
							1800-1830	Deutsche Welle.....	7285, 9700 9745, 11780
							1800-1850	Radio Nacional do Brasil..	15265
							1800-1900	4VEH, Haiti.....	4930
							1800-1900	AFRTS.....	15330, 15340 15430, 17760 11620, 11940 15280
							1800-1900	All India Radio.....	6180, 6190 7325, 9410 11820, 12090 15070, 15400 15720, 11720
							1800-1900	BBC, London.....	6180, 6190 7325, 9410 11820, 12090 15070, 15400 15720, 11720
							1800-1900		9625, 11720
							1800-1900	CBC, N. Quebec Service....	6005
							1800-1900	CFCX, Montreal, Canada.....	6005
							1800-1900	CFRX, Toronto, Canada.....	6070
							1800-1900	CFVP, Calgary, Canada.....	6030
							1800-1900	CKFX, Vancouver, Canada.....	6080
							1800-1900	CKZU, Vancouver.....	6160
							1800-1900	KCBI, Dallas.....	11735
							1800-1900	KNLS, Alaska.....	7355
							1800-1900	KVOH, California.....	17775
							1800-1900	KYOI, Saipan.....	9665
							1800-1900	Radio Australia.....	5995, 6045 6060, 6035 6080, 7215 9580
							1800-1900 A,S	Radio Canada International.	15260, 17820

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1800-1900 TES R. Discovery, Dominican Rep 15045
 1800-1800v Radio Jamahiriya, Libya... 15450v
 1800-1900 Radio Korea... 5975, 15575
 1800-1900 Radio Kuwait... 11675
 1800-1900 MWF Radio Nacional, Eq. Guinea... 9553
 1800-1900 Radio New Zealand Int'l... 11780, 15150
 1800-1900 Radio Moscow... 7115, 7150
 1800-1900 Radio Riyadh, Saudi Arabia... 9720v
 1800-1900 Radio Tanzania... 6105
 1800-1900 Radio Zambia... 9505
 1800-1900 RAE, Argentina... 15435
 1800-1900 TWR, Swaziland... 9550
 1800-1900 Voice of America... 11760, 11920
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 6165, 9535
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 6020, 9540
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 7275, 9765
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 11780, 15150
 11645, 12105
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1800-1900 Voice of Nigeria...
 1800-1900 WHRI, Indiana...
 1800-1900 WINB, Pennsylvania...
 1800-1900 WMLK, Bethel, Pa...
 1800-1900 WRNO Worldwide...
 1800-1900 WYFR, Florida...
 1805-1830 A,S Radio Austria Int'l...
 1814-1817 Radio Suriname Int'l...
 1815-1900 Radio Bangladesh...
 1815-1900 Radio Berlin International...
 1830-1855 M-A BRT Brussels, Belgium...
 1830-1900 Radio Polonia...
 1830-1900 Radio Sofia, Bulgaria...
 1830-1900 Radio Sweden Int'l...
 1830-1900 Radio Tirana...
 1830-1900 Swiss Radio International...
 1830-1900 Radio Netherlands...
 1830-1900 Spanish Foreign Radio...
 1830-1900 Radio Abidjan, Ivory Coast...
 1830-1900 Radio Havana Cuba...
 1830-1900 Radio New Zealand...
 1840-1900 Voice of Greece...
 1845-1900 All India Radio...

1900 UTC [2:00 PM EST/11:00 AM PST]
 1900-1915 Radio Bangladesh... 6240, 7295
 1900-1925 Radio Netherlands... 9855, 11555
 1900-1925 Radio Prague, Czechoslovakia... 6020, 9540
 1900-1930 M-F Radio Canada International... 17605, 21685
 1900-1930 Radio Japan... 5930, 7345
 1900-1930 S Radio Norway Int'l... 5995, 7285
 1900-1930 Spanish Foreign Radio... 15260, 15325
 1900-1930 Voice of Vietnam... 17820, 17875
 1900-2000 4VEH, Haiti... 21695
 1900-2000 AFRTS... 9505
 1900-2000 All India Radio... 7230, 6010
 1900-2000 BBC, London... 6090, 6165
 1900-2000 B.S. Kingdom Saudi Arabia... 9590
 1900-2000 CBC Northern Quebec Serv... 15375
 1900-2000 CFCX, Montreal, Canada... 10040, 15010v
 1900-2000 CFRX, Toronto, Canada... 4930
 1900-2000 CFVP, Calgary, Canada... 15330, 15345
 1900-2000 CKFX, Vancouver, Canada... 15430, 17765
 1900-2000 CKZU, Vancouver, Canada... 21620
 1900-2000 HCJB, Ecuador... 7150, 9665
 1900-2000 KCBI, Texas... 11620, 11845
 1900-2000 KNLS, Alaska... 15265
 1900-2000 KVOH, California... 3955, 7325
 1900-2000 Radio Australia... 9410, 11820
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 6080, 7205
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1900-2000 Radio Beijing... 9860, 11500
 1900-2000 A,S Radio Canada International... 7130, 9555
 1900-2000 TES R. Discovery, Dominican Rep 11945, 15325
 1900-2000 Radio Havana Cuba... 17875
 1900-2000 Radio Kuwait... 15045
 1900-2000 Radio Moscow... 11795
 1900-2000 MWF Radio Nacional, Eq. Guinea... 11675
 1900-2000 Radio New Zealand Int'l... 7115, 7150
 1900-2000 Voice of America... 7195, 11840
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1900-2000 Voice of Nigeria...
 1900-2000 V. Revolution...
 1900-2000 WHRI, Indiana...
 1900-2000 WINB, Pennsylvania...
 1900-2000 WRNO Worldwide...
 1900-2000 WYFR...
 1910-1920 Radio Botswana...
 1920-1930 M-A Voice of Greece...
 1930-2000 Radio Beijing, China...
 1930-2000 Radio Bucharest, Romania...
 1930-2000 Radio Finland...
 1930-2000 Radio Sofia, Bulgaria...
 1930-2000 Voice of Islamic Rep. Iran...
 1940-2000 Radio Ulan Bator Mongolia...
 1950-2000 Vatican Radio...

2000 UTC [3:00 PM EST/12:00 PM PST]

2000-2005 Radio Ghana... 4915
 2000-2005 Radio Ulan Bator Mongolia... 9575, 15305
 2000-2010 Vatican Radio... 6250, 7250
 2000-2010 Voice of Kenya... 9645
 2000-2015 M-F Radio Cotonou, Benin... 4808
 2000-2015 Radio Togo, Lome... 4870
 2000-2025 Radio Beijing, China... 3220, 5047
 2000-2025 Radio Bucharest, Romania... 9440, 11515
 2000-2025 Radio Polonia... 11905
 2000-2025 M-H Radio Poland... 7145, 9690
 2000-2030 Kol Israel... 9750, 11940
 2000-2030 Radio Australia... 7125, 7145
 2000-2030 Radio Algiers, Algeria... 9525, 9695
 2000-2030 Radio Budapest Hungary... 7465, 9435
 2000-2030 M-F Radio Canada International... 11610, 12080
 2000-2030 S Radio Norway International... 6060, 6035
 2000-2030 Radio Polonia... 6045, 6080
 2000-2030 Radio Prague, Czechoslovakia... 7250, 9580
 2000-2030 Radio Yugoslavia... 9620, 9585
 2000-2030 Voice of Islamic Rep. Iran... 11910, 12000
 2000-2030 Voice of Nigeria... 5995, 11945
 2000-2045 All India Radio... 15325, 17820
 2000-2100 AFRTS... 17875
 2000-2100 BBC, London... 7125, 9525
 2000-2100 CBC Northern Quebec Service... 7125, 7145
 2000-2100 CFCX, Montreal, Canada... 9525, 9675
 2000-2100 CFRX, Toronto, Canada... 5930, 7345
 2000-2100 CFVP, Calgary, Canada... 6100, 7240
 2000-2100 CKFX, Vancouver, Canada... 9620
 2000-2100 CKZU, Vancouver, Canada... 9022, 11930
 2000-2100 M-F KCBI, Texas... 7255, 11770
 2000-2100 King of Hope, Lebanon... 7160, 9665
 2000-2100 KNLS, Alaska... 9755, 9910
 2000-2100 KVOH, California... 11620, 11865
 2000-2100 CFCX, Montreal, Canada... 11805, 15330
 2000-2100 CBC Northern Quebec Service... 15345, 15430
 2000-2100 CFCX, Montreal, Canada... 17765
 2000-2100 CFRX, Toronto, Canada... 6180, 6190
 2000-2100 CFVP, Calgary, Canada... 6195, 7320
 2000-2100 CHNX, Halifax, Canada... 9410, 9765
 2000-2100 CKFX, Vancouver, Canada... 11820, 15070
 2000-2100 CKZV, Canada... 15260, 15400
 2000-2100 M-F KCBI, Texas... 9625, 11720
 2000-2100 King of Hope, Lebanon... 6005
 2000-2100 KNLS, Alaska... 6070
 2000-2100 KVOH, California... 6030
 2000-2100 CFCX, Montreal, Canada... 6130
 2000-2100 CBC Northern Quebec Service... 6080
 2000-2100 CFCX, Montreal, Canada... 6160
 2000-2100 CFRX, Toronto, Canada... 11790
 2000-2100 CFVP, Calgary, Canada... 6280
 2000-2100 CHNX, Halifax, Canada... 7355
 2000-2100 CKFX, Vancouver, Canada... 17775
 2000-2100 CKZV, Canada... 9625, 11720
 2000-2100 CFCX, Montreal, Canada... 6005
 2000-2100 CFRX, Toronto, Canada... 6070
 2000-2100 CFVP, Calgary, Canada... 6030
 2000-2100 CHNX, Halifax, Canada... 6130
 2000-2100 CKFX, Vancouver, Canada... 6080
 2000-2100 CKZV, Canada... 6160
 2000-2100 M-F KCBI, Texas... 11790
 2000-2100 King of Hope, Lebanon... 6280
 2000-2100 KNLS, Alaska... 7355
 2000-2100 KVOH, California... 17775

2000-2100 KYOI, Saipan... 9670
 2000-2100 Radio Kuwait... 11675
 2000-2100 Radio Moscow... 7115, 7125
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2000-2100 R. Nacional, Equator Guinea 15106v
 2000-2100 Radio New Zealand... 11780, 15150
 2000-2100 Radio Pyongyang, N. Korea... 6575, 7105
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2000-2100 Radio Zambia... 9977
 2000-2100 Voice of America... 9505
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2000-2100 WHRI, Indiana...
 2000-2100 S,A WINB, Red Lion, Penna...
 2000-2100 WRNO Worldwide...
 2000-2100 WYFR, Okeechobee, Florida...
 2000-2030 Kol Israel...
 2005-2100 Radio Damascus Syria...
 2015-2100 ELWA, Liberia...
 2015-2045 RAI, Italy...
 2015-2100 Radio Cairo, Egypt...
 2030-2100 Falkland Islands Bcast Svc...
 2030-2100 IBRA Radio...
 2030-2100 Radio Australia...
 2030-2100 Radio Beijing...
 2030-2100 Radio Netherland...
 2030-2100 M-F Radio Portugal...
 2030-2100 Voice of Nigeria...
 2030-2100 Voice of Vietnam...
 2045-2100 All India Radio...
 2045-2100 Vatican Radio...
 2050-2025 Voice of Islamic Rep., Iran...

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2100-2105 Radio Damascus Syria... 7455, 99
 2100-2110 Vatican Radio... 6200, 72
 2100-2115 Radio Cairo, Egypt... 9655
 2100-2115 Radio New Zealand Int'l... 11780, 151
 2100-2220 ELWA, Liberia... 11830
 2100-2125 S-F CBC Northern Quebec Service... 9625, 117
 2100-2125 Radio Beijing... 9440, 115
 2100-2125 Radio Netherland... 9540, 97
 2100-2130 Radio Finland... 9895, 117
 2100-2130 Radio Australia... 6120, 117
 2100-2130 Radio Bucharest, Romania... 6080, 95
 2100-2130 Radio Canada Int'l... 9620, 151
 2100-2130 Radio Japan General Service... 15395
 2100-2130 Radio Sweden International... 6055, 71
 2100-2130 Swiss Radio International... 7195, 96
 2100-2130 WRNO Worldwide... 11960, 153
 2100-2140 Radio Havana Cuba... 7140, 96
 2100-2150 Deutsche Welle, West Germany... 11815
 2100-2150 Radio Pyongyang, N. Korea... 11845, 119
 2100-2155 Radio Beijing... 9635, 98
 2100-2156 Radio RSA, South Africa... 11955, 120
 2100-2200 AFRTS... 15420
 2100-2200 All India Radio... 15260, 153
 2100-2200 BBC, London... 9675, 97
 2100-2200 CFCX, Montreal, Canada... 11815
 2100-2200 CFRX, Toronto, Canada... 6575, 93
 2100-2200 CFVP, Calgary, Canada... 11660
 2100-2200 CHNX, Halifax, Canada... 11500
 2100-2200 CKFX, Vancouver, Canada... 4810, 72
 2100-2200 CKZV, Canada... 9585, 115
 2100-2200 M-F KCBI, Texas... 15330, 153
 2100-2200 King of Hope, Lebanon... 17765
 2100-2200 KNLS, Alaska... 7412, 96
 2100-2200 KVOH, California... 9910, 116
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2100-2200	CFRX, Toronto, Canada.....	6070	
2100-2200	CFVP, Calgary, Canada.....	6030	
2100-2200	CHNX, Halifax, Canada.....	6130	
2100-2200	CKFX, Vancouver, Canada.....	6080	
2100-2200	Falkland Islands Bcast Svc..	2380, 3958	
2100-2200	FEN, Tokyo.....	15260	
2100-2200	King of Hope, Lebanon.....	6280	
2100-2200	KNLS, Alaska.....	7355	
2100-2200	KSDA, Guam.....	7160, 11965	
2100-2200	KVOH, California.....	17775	
2100-2200	KYOI, Saipan.....	9670	
2100-2200	Radio Baghdad, Iraq.....	7170	
2100-2200 M-F	Radio Canada International..	11960, 15325	
2100-2200v	Radio Jamahiriya, Libya.....	7245	
		9635, 11815	
2100-2200	Radio Moscow.....	5945, 7130	
		7150, 11840	
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2100-2200 M-A	Radio Nacional Angola.....	9535, 7245	
2100-2200	R. Nacional, Equat. Guinea.	15106v	
2100-2200 F,A	Radio Zambia.....	9505	
2100-2200	RTL, Luxembourg.....	6090	
2100-2200	Voice of Africa (Cairo)....	15375	
2100-2200	Voice of America.....	7445 LSB	
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		15410, 15445	
		15580, 17800	
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2100-2200	Voice of Asia.....	7445, 9845	
2100-2200	Voice of Nigeria.....	15120	
2100-2200	Voice of Turkey.....	7215	
2100-2200	WHRI, Indiana.....	9770	
2100-2200	WYFR, Okeechobee, Florida..	6100, 9535	
		11830, 15170	
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2105-2200	Radio Damascus, Syria.....	9950	
2115-2145	Radio Cairo.....	9805	
2115-2120 F	Radio Free Europe, W. Germany	3970, 6135	
		7200, 9725	
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2130-2200 T,F	BBC Falklands Service.....	9915, 11820	
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2130-2200 S-F	CBC Northern Quebec Service.	9625, 11720	
2130-2200	HCJB, Quito, Ecuador.....	11740, 15270	
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2130-2200	KGEI, San Francisco, CA.....	15280	
2130-2200	Radio Austria International..	5945, 6000	
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2130-2200	Radio Australia.....	15150, 15160	
		15395	
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2130-2200	Radio Canada International..	11945, 15150	
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2130-2200	Radio Prague.....	6055	
2130-2200	Radio Sofia, Bulgaria.....	6070, 7115	
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2130-2200	WRNO, Worldwide.....	11705	
2145-2200	Radio Berlin International..	6125	

2200-2300	CKZU, Vancouver.....	6160	
2200-2300	Falkland Islands Bcast Svc..	2380 / 3958	
2200-2300	King of Hope, Lebanon.....	6280	
2200-2300	KSDA, Guam.....	7160	
2200-2300	KVOH, California.....	17775	
2200-2300	KYOI, Saipan.....	15405	
2200-2300	Radio Australia.....	15160, 15240	
		15320, 15395	
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2200-2300 M-F	Radio Canada International..	6170, 7230	
		11945, 15325	
2200-2300	Radio Havana Cuba.....	11705	
2200-2300	Radio Korea.....	6480, 7550	
2200-2300	Radio Moscow.....	5915, 5945	
		6200, 7115	
		7310, 13665	

2200-2300	Radio Pyongyang, N. Korea...	11735	
2200-2300	Voice of America.....	6045, 11775	
		15185, 15290	
		15445, 15580	
		17740, 17775	
		17800, 17820	

2200-2300	Voice of Free China, Taiwan.	6155, 7355	
		9955	

2200-2300	WHRI, Indiana.....	9770	
2200-2300	WRNO, Louisiana.....	11705	
2200-2300	WYFR, Okeechobee, Florida..	11830, 15170	
2205-2230	Vatican Radio.....	6015, 9615	
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2215-2230	Radio Yugoslavia.....	6100, 7240	
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2230-2300 S	CBC Northern Quebec Service.	9625, 11720	
2230-2300	Kol Israel.....	5885, 7465	
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2230-2300	Radio Mediterran, Malta.....	6110	
2230-2300 S	Radio Nacional Angola.....	7245, 9535	
2230-2300	Radio Polonia.....	5995, 6135	
		7125, 7270	

2230-2300	Radio Sofia, Bulgaria.....	11720	
2230-2300	Swiss Radio International..	6190	
2230-2300	WRNO, Louisiana.....	9852.5	
2245-2300	All India Radio.....	6035, 7215	
		9595, 9912	
		11765	

2245-2300	GBC1 Ghana.....	4915	
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2300 UTC	[6:00 PM EST/3:00 PM PST]		
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2300-2330	BBC, London.....	5975, 6005	
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		7325, 9410	
		9515, 9590	
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2300-2345	Radio Berlin Int'l.....	6070, 6125	
		6165	

2300-2330	Radio Canada International..	9755, 11710	
2300-2330	Radio Sofia, Bulgaria.....	11720	
2300-2330	Radio Sweden International..	6045, 9695	

2300-2330	Radio Vilnius, Lithuania....	6200, 7	
		9765, 11	
		13645, 15	

2300-2345	WYFR, Okeechobee, Florida.	15400	
2300-2350	Voice of Turkey.....	6105, 7	
		9560, 9	

2300-0000	4VEH, Haiti.....	4930	
2300-0000	AFRTS.....	6030, 11	
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2300-0000 A	CBC Northern Quebec Service.	6195, 9	
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2300-0000	CFCX, Montreal, Canada.....	6005	
2300-0000	CFRX, Toronto, Canada.....	6070	
2300-0000	CFVP, Calgary, Canada.....	6030	
2300-0000	CHNX, Halifax, Canada.....	6130	
2300-0000	CKFX, Vancouver, Canada.....	6080	
2300-0000	CKZU, Vancouver.....	6160	
2300-0000	Falkland Islands Bcast Svc..	2380 / 3	
2300-0000	FEBC, Manila.....	15320	
2300-0000	KVOH, California.....	17775	
2300-0000	KYOI, Saipan.....	15405	
2300-0000	Radio Australia.....	15160, 15	
		15320, 17	
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2300-0000	Radio Clarin, Dominican R.	11700	
2300-0000	Radio Japan General Service.	7140, 9	
		9675, 15	

2300-0000	Radio Korea, South.....	15575	
2300-0000	Radio Moscow.....	5915, 5	
		5980, 6	
		7115, 7	
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2300-0000	Radio Prague, Czechoslovakia	6055, 9	
2300-0000	Radio Pyongyang, N. Korea..	11735, 13	
2300-0000	Radio Thailand.....	9650, 11	
2300-0000	RTL, Luxembourg.....	6090	
2300-0000	Spanish Foreign Radio.....	6020	
2300-0000	Voice of America.....	9640, 11	
		15160, 15	
		15290, 17	
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2300-0000	Radio Prague, Czechoslovakia	6055, 9	
2300-0000	Radio Pyongyang, N. Korea..	11735, 13	
2300-0000	Radio Thailand.....	9650, 11	
2300-0000	RTL, Luxembourg.....	6090	
2300-0000	Spanish Foreign Radio.....	6020	
2300-0000	Voice of America.....	9640, 11	
		15160, 15	
		15290, 17	
		17740, 17	

2300-0000	WHRI, Indiana.....	11770	
2300-0000	WRNO, Worldwide.....	9852.5	
2300-0000	WYFR, Florida.....	6300, 7	
		11830, 11	
		15365	

2300-0000	WHRI, Indiana.....	11770	
2300-0000	WRNO, Worldwide.....	9852.5	
2300-0000	WYFR, Florida.....	6300, 7	
		11830, 11	
		15365	

2300-0000	WHRI, Indiana.....	11770	
2300-0000	WRNO, Worldwide.....	9852.5	
2300-0000	WYFR, Florida.....	6300, 7	
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2300-0000	BBC, London.....	5975, 6	
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		7325, 9	
		9590, 9	
		12095	

2300-0000 S-F	Radio Canada International..	5960, 9	
2300-0000 TES	Radio Veritas, Philippines...	9740	
2300-0000	Voice of Vietnam.....	9755, 9	
		12035	

2300-0000	Voice of Nicaragua.....	6015	
2335-2345	Voice of Greece.....	9395, 11	
2345-0000	Radio Berlin Int'l.....	6080, 9	
2345-0000	Radio Korea, South.....	7275, 15	

2200 UTC	[5:00 PM EST/2:00 PM PST]		
2200-2205	Radio Damascus, Syria.....	7455, 9950	
2200-2207	Voice of America.....	11740, 15160	
		17730, 17775	
2200-2210	Radio Sierra Leone.....	5980	
2200-2225	BRT, Belgium.....	5900, 5910	
2200-2225	RAI, Italy.....	9710, 11800	
		15330	
2200-2230	All India Radio.....	7160, 9550	
		9665, 9910	
		11620, 11870	
2200-2230 S-F	CBC Northern Quebec Service.	9625, 9755	
		11720	
2200-2230	Radio Berlin International..	6125	
2200-2230	Radio Canada International..	5960, 9755	
2200-2230 S	Radio Norway International..	9525, 9605	
2200-2245	Radio Cairo, Egypt.....	9805	
2200-2245	WINB, Red Lion, Penna.....	15185	
2200-2300	AFRTS.....	6030, 11790	
		15330, 15345	
		17765, 21570	
2200-2300	BBC, London.....	3955, 5975	
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		9590, 9915	
		11750, 15260	
2200-2300	CFCX, Montreal, Canada.....	6005	
2200-2300	CFRX, Toronto, Canada.....	6070	
2200-2300	CFVP, Calgary, Canada.....	6030	
2200-2300	CHNX, Halifax, Canada.....	6130	
2200-2300	CKFX, Vancouver, Canada.....	6080	



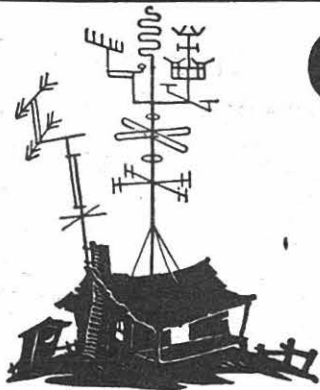
WE'RE
UGLY

Station News * DX Tips * Advance Program Details * Frequencies *
Equipment News * Articles * and More

We've got to be honest with you. If you send for a copy of World Radio Report and expect a full-color, slick 'n glossy magazine with ads for \$50,000 cars and designer cigarettes, you're going to be disappointed. On the other hand, if what you want is the latest, most up-to-date information on what to hear and where to tune, then you're going to love World Radio Report. Written and published by full-time shortwave pros, we cover the world -- from station and equipment news to DX tips -- for you each month.

If you're serious about your shortwave, you owe it to yourself -- and your radio -- to check out World Radio Report. One year of World Radio Report is just \$18.00. Sample copies are just \$2.50 in the U.S.; \$3.50 elsewhere in the world. Send check, money order or cash to World Press International Inc., 3 Lisa Drive, Thorndale, PA 19372. From the publishers of International Radio.

World Radio Report
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GETTING STARTED

Ike Kerschner
RD 1 Box 181-A
Kunkletown, PA 18058

LIGHTNING PROTECTION FOR YOUR RADIO!

In the northern hemisphere March heralds the start of spring and the thunderstorm season. The cumulonimbus clouds of these storms are the source of electrical charges that produce lightning.

The lower portion of the clouds contain negative charges while positive charges exist in the upper portion and the earth beneath the storm. When the difference between the charges becomes too great an electrical breakdown occurs and a spark discharges which we call lightning.

Currents of 12,000 to 200,000 amperes are present in a single lightning stroke. Anyone seeing an object that has been struck by lightning is immediately impressed with the power of such a bolt! Less spectacular but just as impressive to the unprotected radio is the voltage a lightning strike can induce in a wire—even at great distances.

A strike near a power line that feeds your home can result in a large surge of electricity that is capable of damaging any unprotected devices connected to it including your expensive radio!

Power companies go to great lengths to protect their transmission lines with grounds and surge protectors, but this will not prevent a nearby strike from causing damage to your home electrical system.

Devices are available that will provide good protection for your home. Secondary, low-voltage lightning arresters rated at 650 volts (i.e., GE Thyrite 9L15BC002) and low voltage surge arresters (i.e., GE V130PA20A) can be installed by an electrician! Devices that you can install yourself include transient voltage protectors designed to plug into the wall socket like the Alpha Delta AC-TT and Grove Power Protector ACC-2 (fig. A).

The same stroke that you have just arrested on the power line can still damage your radio by entering through the antenna. Even storms miles away induce voltages in the antenna that will damage the delicate components in your receiver. While several antenna lightning arresters

are available, I suggest a device like the Alpha Delta Model LT (Fig. B). Whatever device you use, a GOOD ground is important; do not count on a makeshift ground system (a hunk of bell wire to a pipe won't cut it).

A Good Ground

An adequate ground system consists of a ground rod six to eight feet long driven full length into the earth. Connect the ground rod to the radio via a low impedance conductor such as #8 or #6 gauge copper wire (I use 1/4" copper pipe) that is as short as possible. An alternative to the ground rod is to use the cold water system in your home for your station's ground. Be sure that your cold water system is constructed of steel or copper pipe and not PVC!

In addition, I suggest bonding a copper strap secured with U-bolts across each pipe joint between your radio and the point where the pipe enters the house to guarantee conduction across pipe dope.

The truth of the matter is that the only sure way you can avoid damage to your station is to disconnect the antenna and power line from your set. Ground all the antennas directly to a good earth ground and wait for the storm to pass.

December Contest

The winner of the December contest was Helen Setty of 628 West State, Kokomo, Indiana. The prize was a complete 80 meter antenna kit that was donated by the Radio Works, P.O. Box 6159, Portsmouth, Virginia 23703 (a good source for antennas, wire and accessories).

Letters

I received two letters that I would like to share with you. The first is from Bob Brossell, 274 Meadowside



ALPHA DELTA AC-TT
Transient Voltage Protector



Fig. A. Alpha Delta
ACC-TT and Grove ACC-2

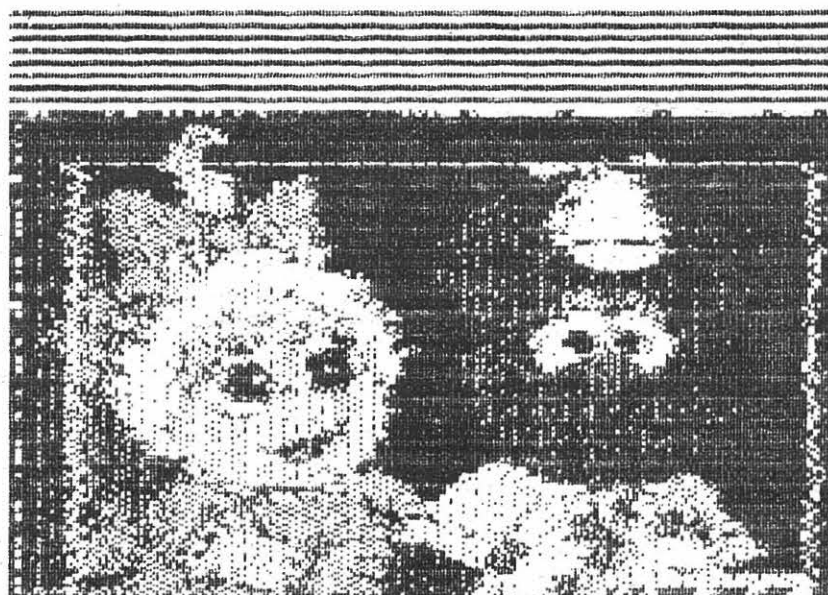


Fig. 1. SSTV picture from Mike Cournoyer

Ct., Pewaukee, Wisconsin, 53072.

"Ike, I have been using the Mezt SW1 antenna with great success; it's mounted on the roof and does not exhibit the noise that a long wire does.

"This short (54 inch) unamplified antenna has consistently outperformed my former 50' long wire. Two shortwave stations which I've logged and verified, Vanuatu and Cape Verde, were never audible with the long wire!"

(Metz builds an entire series of antennas for use from MF through UHF. The antennas appear to be well built. Address is METZ Communications Corp., Lily Pond Road, Gilford, New Hampshire 03246 or phone 1-800-258-4680.)

The second letter is from Michael Cournoyer, Sr. WDX2RBL. He writes, "I have two receivers, Radio Shack DX-160 and DX-400 and a Radio Shack TRS 80 Color Computer with a Slow Scan TV program and a long wire. I am a utility and military DXer and like to monitor various FAX stations." Mike enclosed several FAX and SSTV photos he copied on his equipment (See figs. 1, 2, and 3). This goes to prove that you do not need a lot of exotic gear to copy some interesting modes.

The TRS 80 color computer was selling for a hundred bucks last Christmas and the program and interface should not be more than another hundred or so. There are FAX programs available for the C64, IBM and Apple computers, too. I wonder how many of you are receiving FAX/SSTV?--

An interesting card came from Hal Hoffman, WDX5FAZ, in Dallas, Texas. Hal has been an SWL for four years and is eleven years old. "I would like to see more folks that age in this hobby!"

WDX5FAZ

Hal Hoffman
17347 Stedman Dr.
Dallas, TX USA 75252



Scanners

I receive a lot of mail concerning scanners; some folks want to know more and others are bored by scanners. Seems to be about a 50-50 split. Let me make a case why more of you should use a scanner.

How many of you heard Voyager on its epic around the world non-stop flight? Did you know where to look for their comms? I did--a scanner told me! Listening to the local two meter amateur repeater on my scanner I overheard one fellow say he was reading Voyager on 8.822 MHz. Sure 'nuff, there he was loud and clear!

This is not the first time I picked up that kind of information on the local repeater. Many hams are avid SWL's and some have extremely good contacts in the communications field. They are happy to pass that info on to their friends and listeners. Many DX buffs use local repeaters as an intercom to tell their buddies where the new countries are and when they will be on. Get involved!



Fig. B. Alpha Delta Transi-Trap

(CLASSIFICATION from p.9)

those at each base, location, etc., previously approved for access.

Strategic Intelligence (SI):

Similar to SCI. Very limited access.

There are others, but those are the most commonly used. Many additional semi-permanent and temporary access control designators are intended to be used for one project or area of interest. Only those who have a need to know for that application are allowed to see the information. The project names are picked at random from an approved list and are only used once,--some for a few days and some for years depending upon the project to which they are assigned.

The names will usually consist of two words such as: Green Door, Polka Dot, Spark Plug, Blue Shower, etc., but occasionally only one name is used such as Magic, Purple, Ultra (all from World War II).

The code word(s) are stamped on all information regarding that project along with the other required markings.

Another type of marking, used almost exclusively on intelligence information, is the source designation:

SIGINT (signals intelligence)
COMINT (communications intelligence)
ELINT (electronics intelligence)
HUMINT (human intelligence--spying)

There are others, but you get the idea. In utilizing and analyzing intelligence information, the type of source is important to know even if the specific source is kept secret. A system of grading is used to indicate the probable quality of the information.

CLASSIFICATION DETERMINATION

The two basic methods of determining the security classification and access level of information and material are by using security classification guides and/or by obtaining a decision from certain individuals who have been designated a "classification authority."

A classification guide is a document issued by an authorized original classifier that prescribes the level of classification and appropriate declassification instructions for specified information to be classified on a derivative bases.

A classification authority is an official of a user agency vested with the authority to make an initial determination that information requires protection against unauthorized disclosure in the interest of national security.

A classifier is an individual who makes a classification determination and applies a security classification to information or material. He may be a classification authority or may assign a security classification based on a properly classified source or a classification guide.

The classifier may be a government civilian or military employee or a contractor civilian, but original

classification authority is no longer given to contractor civilians (since the Pentagon Papers incident) and it was very rare even before that.

TO SUM IT UP...

Information and/or material is reviewed for security and may then be classified at one of three levels. It may also be specifically limited as to who can have access to it (all classified information is limited to those who have a need to know--the access markings simply make it easier to determine who has the need by predetermining each individual's access requirements), and the information may be marked to indicate the sensitivity of its source and who controls it.

Really super-sensitive or potentially dangerous information and material (such as atomic weapons, launch codes for ICBMs, etc.) may also require two-person control. This means that when it is not locked up in a two combination safe or vault and is in the possession of humans, a minimum of two properly-cleared individuals must always be present.

NEXT MONTH: Physical Security and Controls

Radar Jammers Thwart Law Enforcement

A letter received some time ago from a reader pointed out that radar speed detection jammers are widely sold, despite their illegality. An issue of *Car and Driver* listed the following products and sources:

Evader (Automotive Outfitters, 96 W. Old Country Rd., Hicksville, NY 11801)
Greenspan Super Jammer (Greenspan Associates, PO box 741571, Houston, TX 77274)

Jam-it (Jami-it Corporation, PO box 5519, Beaverton, OR 97006)

Judge Pulsar (Midland Instruments, Inc., PO box 3052, Midland, TX 79702)

Oregon Microwave (9513 SW Barbo Blvd., #109E, Portland, OR 97219)

Remote Systems (13009 Glenview D Burnsville, MN 55337)

It would be interesting to know how many of these companies still provide such a product and how effectively they confound radar speed detectors.

(GETTING STARTED, cont'd)

Would you like to be part of a long-term propagation study? Participants will monitor selected frequencies in the 28 MHz range and submit monthly reports. You will need a stable, accurate receiver and the ability to erect outside antennas.

Selected stations will perform specific experiments over a period of five years. Monitoring stations worldwide are required. If you are interested in knowing more about the program please contact me at my Kunkletown, Pennsylvania, address.

That's all for this month; keep the cards and letters coming.

Fig. 3.

Fig. 2. Mike Cournoyer's shack displays Coast Guard and Navy pictures from QSL's as well as from some Navy and weather FAX stations.



WDX2RBL

SHORTWAVE LISTENING

RTTY/ASCH/CW

SSTV-FAX

with the
TRS-80* COLOR COMPUTER



Michael Cournoyer, Sr.
2708 Third Avenue
Watervliet, NY 12189

USED EQUIPMENT

Receivers, Scanners, Accessories



All equipment subject to prior sale. Prices include 90 day limited warranty and UPS shipping. For charge orders or C.O.D. call 1-704-837-9200. Send check or money order to Grove Enterprises, Inc., P.O. Box 98, Brasstown, NC 28902.

All this and more -- Send for complete list!

- **NRD 515 LUXURY RECEIVING STATION** - like new, 10 kHz - 30 MHz receiver, cost \$900, sell \$799; NDH 515 25-channel memory unit, cost \$175, sell \$129; NCM 515 remote control, cost \$145, sell \$99. Available separately or all three for \$1000.00.
- **DRAKE TR7/DR7 DELUXE TRANSCEIVER**, Like new with 0-30 MHz receive, all amateur bands (including 3 new WARC bands) transmit. PS 7 heavy duty power supply, NB7 noise blanker, FA7 fan, SL-1800 1.8 kHz filter, SL-6000 6 kHz filter, 2.3 kHz SSB filter, manual, original cartons. Cost over \$2000, sell \$895.
- **REGENCY HX1500 HANDHELD SCANNER** - like new with AC adaptor, rechargeable batteries, flex whip, earphone, belt clip, manual, original carton. Cost \$289, sell \$189.
- **SONY 2010 GENERAL COVERAGE RECEIVER** - excellent with AC adaptor, wire antenna, manual. Cost \$315, sell \$199.
- **SONY 7" RV/TV**, good condition, includes cigarette-lighter adaptor cable. Sell \$29.
- **KENWOOD R2000 SHORTWAVE RECEIVER** - like new, all accessories, manual and original box. Cost \$500, sell \$379.
- **INFOTECH M200E MULTIMODE DEMODULATOR** - Morse (6-85 wpm), RTTY (60, 66, 75, 100 wpm, and ASCII, like new with manual and original box; cost \$400, sell \$199.
- **GROVE MINITUNER 3** - \$25, **GROVE POWERANT 4 PREAMPLIFIER** - \$25, **GROVE SCANVERTER (CVR1A)** \$29, All in good condition.
- **MFJ 1020-A ACTIVE ANTENNA**, excellent, 200 kHz - 30 MHz. Cost \$79, sell \$49.
- **QUME SPRITE DAISY WHEEL PRINTER**; wide carriage, extra print wheels and ribbons; excellent. Cost \$2000, sell \$850.
- **RADIO SHACK 150A GENERAL COVERAGE RECEIVER** - excellent with manual. Sell \$89.
- **BEARCAT 210XL SCANNER** - excellent with whip, DC cord, manual, AC cord, display a little dimmer than when new. Cost \$200, sell \$95.

Grove Enterprises



We welcome short, useful listening hints, tips on equipment use, hard-to-find sources, etc.; Let others profit by your hard-won experience!

TAMING COMPUTER INTERFERENCE

by David Crotty

Any computer that was built before 1985 did not have to meet the newer FCC radio interference regulations. If you try to use one near a short-wave radio you are likely to hear noise from the computer's circuits.

When I obtained a Kantronics unit in the hopes of tuning in on RTTY and TOR broadcasts I soon discovered that the Epson QX-10 was a very noisy machine. As the system booted and as programs were loaded and operated an entire chorus of interesting noises could be heard from 1 to 15 MHz.

After trying the usual remedies that include noise filters in the power lines, wrapping cables through toroid rings and moving the radio and antenna cable, I decided to dig into the computer. I worked for a firm that deals with the electroplating of EMI (electromagnetic interference) shields on equipment housings; from this I realized that an extremely thin layer of copper would shield much better than a very thick sheet of steel. In fact, some manufacturers plate copper on steel enclosures for this purpose. The 2 mil (0.002 inch) copper foil that I chose for the task is about 100 times thicker than the plated EMI shields commonly used.

My Epson QX-10 consists of the CPU, two disk drives and all the computer circuits. The keyboard and monitor are separate. I determined that they were not the real problems by operating the computer without them as a test. The noise was coming from the CPU.

The evening I chose to operate on the CPU was wet and foggy. I don't recommend a night in winter when the cat's fur is full of static.

A Simple Procedure

The CPU itself came apart in two layers: The lower half contained the mother board and power supply while the upper half held the disk drives. I disconnected the cables between them.

The mother board had two layers, each attached to the plastic shell.

Under these was a steel plate. The various screws that held the two layers and the power supply to the shell were of several types and had to be returned to their proper places; a few of the screws were well hidden.

After all the parts had been removed I had to cut two sections of the copper foil to cover the entire shell; I also had to trim the section carefully to allow for the power switch, reset button and keyboard port as well as a few areas when the foil might touch the circuit boards. Since the steel plate sat directly on the copper sections there was no need to make additional electrical connections to the ground when I reassembled this lower half.

Step Two:

The two disk drives came out of the upper shell in one piece. I fashioned copper foil sections for the upper shell as I did for the lower. The drives were surrounded with thick sheet metal and the act of screwing them back into the upper shell also held the foil sections firmly in place and made good ground contact.

At this point the disk drives had copper above them but not below. A few screws held a ground strap in place under the drives and this made it easy for me to secure another piece of copper foil underneath.

This essentially completed the shielding of the machine. The copper foils completely covered the outside shell halves (except for the expansion slot cover) and were firmly held down by the various components that had been reassembled into the shells.

After the cables were reconnected and the two halves put back together, not only did the computer actually work but it was quiet over the radio! However, this is not exactly the end of the story.

In the expansion slots went two boards: a 2 meg SemiDisk and an MS/DOS board. The MS/DOS board was quiet but the SemiDisk was as noisy as the entire unshielded computer had been by itself!

BC-350 + Converter = A 50-Channel Military Air-Band Scanner

Larry Wiland

When I went shopping for a scanner which covers the 225-400 MHz military aircraft band, I found myself looking at a very limited selection of scanners; all of which had some sort of drawback of one kind or another. Some had only 20 memory channels; others had price tags up to \$1000!

A look at the military surplus market quickly revealed that this type of equipment sells for as much or more than some of the scanners which cover this band! Not only that, some dealers won't even guarantee them to work nor offer any type of warranty on what they sell.

More than one amateur friend have advised me that replacement and repair parts for these units are very hard (if not altogether impossible) to find, and most local repair shops won't even touch them. So, if you can't fix radios yourself, forget this route!

Some time ago, I acquired a Bearcat 350 alpha-numeric scanner (now discontinued); the display can be programmed with both the frequency and a user-programmed alphabet; enabling the user to have the channel read out in numbers or alphabetical letters. This scanner can also receive the AM civilian aircraft band.

I secured a section of foil to the expansion slot cover using a spray glue by 3M called "Spray-Ment Art and Display Adhesive" and soldered a 22 gauge wire from this cover to a ground point. This had absolutely no effect on the radio noise from the SemiDisk board.

I realized that an electrical ground is not necessarily the same as a radio ground; with that in mind I fashioned a two-inch-wide ground strap that was soldered to the copper on the cover and the foil in the lower shell half. While this didn't shield the total system quite as well as it was without the SemiDisk the radio noise level is now low enough to be acceptable.

An SWL who is handy enough with tools and a scissors can probably tame most of the machines in existence. The copper foil may be difficult to find but most areas should have a distributor of copper and brass that will be willing to supply the three or four square feet of foil needed for this job. I am certain that other metal foils--aluminum, for instance--will have almost no effect in constructing an EMI shield. ■

A visit to a hamfest produced a Grove Enterprises "Scanverter CVR-1B" which converts the regular AM air band to military aircraft band coverage. Hamtronics (65 Moul Rd., Hilton, NY 04468) also makes a 240-270 MHz converter. Either device combined with the BC-350 provides excellent reception at our test site about eight miles from the Youngstown airport.

The best part, however, was when I discovered that the alpha-numeric ability of the BC-350 enabled me to program in the TRUE UHF aero frequencies in the "alphabet" mode: I first programmed in the converted frequency (129.4) and then programmed the received UHF frequency (255.4) as well.

Now, I leave the scanner in the "alphabetic" mode to enjoy a 50-channel military airband scanner with TRUE frequency readout. Granted, it isn't like your SX-400 or Icom R7000, but it cost a LOT less (\$200 for a used BC-350 scanner and \$25.00 for the used Scanverter).

I added a wideband in-line amplifier and *really* increased my "listening power." As the man said... "Try it you'll like it!"

CAR PHONE SCANNER?!

Mark Swarbrick

All car phones have a built-in receiver function to help the repair technician to fix the phone; with little help a car phone can be converted into a mobile phone scanner.

Novotel models all have a computer "back door" which allows access to its internal memory and diagnostic. For the Novotel 150 the code is (FCN) Lock * 259 (CLR) #; the Novotel 290 or 390 is (FCN) Loc #82*.

These codes must be entered within 5 seconds and the display will change.

Push the volume control up or down until "frequency" is displayed; Enter three-digit numbers (350-999) into this display until you can hear conversation. On the 290 or 390 models push the volume control until "receiver" is displayed; push (SNL) to toggle it on; push volume '1' frequency is displayed, and enter the channel.

The speaker volume display will allow you to raise the volume (1-10); Do not make any other changes as this will shut the phone down. By entering the channel numbers randomly you will find conversations. Write down the number and continue on until you have a list, then you can jump from conversation to conversation with little effort.

Occasionally, you will hear a buzz noise and the phone conversation will disappear due to cell changes. To exit this mode push (End).

All car phones have this receiver but without knowing the codes it is impossible to access. This information is very difficult to obtain. If you can, watch the installer during programming.

(NOTE: While MT does not condone unauthorized monitoring of mobile telephone, the technical insight offered by reader Swarbrick is unusual and worthy of note...Ed)

BEARCAT 250 HEAT FIX

John Henault, KA10XZ-KDX1SWL

On page 54 of the January 87 issue of MT, Mr. Martin Tommajian, Jr., did a very nice article on the erratic display of Bearcat 250's. The article could not have occurred at a more perfect time: My trusty old Bearcat 250 had started to display just such abnormalities as described in the article.

I tested transistor Q204 and found it was working in what appeared to be normal specifications according to the repair manuals; however, I accidentally touched this transistor and found it to be very hot to the touch.

Instead of replacing the errant transistor, I found a good-sized Heat Sink and a little heat sink grease, slipped in onto the metal tab of Q204 and my problems disappeared. Total cost for repairs, about \$1.19 plus tax!

TAPING ON YOUR VCR

Dennis Hanley

As you know, on January 10, a special DX/SWL program was broadcast over the ABC Radio Network.

Here was my dilemma: Previous plans for that weekend had been made, and it was not practical to listen in to the broadcast. The longest cassette tape that I could use to record it would only last for one hour, and the program was to last for five hours.

NEW! Turbo Scan Scanners

Communications Electronics,™ the world's largest distributor of radio scanners, introduces new lower prices to celebrate our 16th anniversary.

NEW! Regency® TS2-LA

Allow 30-120 days for delivery after receipt of order due to the high demand for this product. List price \$499.95/CE price \$319.95. 12-Band, 75 Channel • Crystalless • AC/DC. Frequency range: 29-54, 118-174, 406-512, 806-950 MHz. The Regency TS2 scanner lets you monitor Military, Space Satellites, Government, Railroad, Justice Department, State Department, Fish & Game, Immigration, Marine, Police and Fire Departments, Aeronautical AM band, Paramedics, Amateur Radio, plus thousands of other radio frequencies most scanners can't pick up. The Regency TS2 features new 40 channel per second Turbo Scan™ so you won't miss any of the action. Model TS1-LA is a 35 channel version of this radio without the 800 MHz. band and costs only \$239.95.

Regency® Z60-LA

List price \$299.95/CE price \$184.95/SPECIAL 8-Band, 60 Channel • No-crystal scanner. Bands: 30-50, 88-108, 118-136, 144-174, 440-512 MHz. The Regency Z60 covers all the public service bands plus aircraft and FM music for a total of eight bands. The Z60 also features an alarm clock and priority control as well as AC/DC operation. Order today.

Regency® Z45-LA

List price \$259.95/CE price \$159.95/SPECIAL 7-Band, 45 Channel • No-crystal scanner. Bands: 30-50, 118-136, 144-174, 440-512 MHz. The Regency Z45 is very similar to the Z60 model listed above however it does not have the commercial FM broadcast band. The Z45, now at a special price from Communications Electronics.

Regency® RH250B-LA

List price \$699.95/CE price \$329.95/SPECIAL 10 Channel • 25 Watt Transceiver • Priority. The Regency RH250B is a ten-channel VHF land mobile transceiver designed to cover any frequency between 150 to 162 MHz. Since this radio is synthesized, no expensive crystals are needed to store up to ten frequencies without battery backup. All radios come with CTCSS tone and scanning capabilities. A monitor and night/day switch is also standard. This transceiver even has a priority function. The RH250 makes an ideal radio for any police or fire department volunteer because of its low cost and high performance. A 60 Watt VHF 150-162 MHz. version called the RH600B-LA is available for \$439.95. A UHF 15 watt version of this radio called the RU150B-LA is also available and covers 450-482 MHz. but the cost is \$439.95.

Bearcat® 50XL-LA

List price \$199.95/CE price \$114.95/SPECIAL 10-Band, 10 Channel • Handheld scanner. Bands: 29-7-54, 136-174, 406-512 MHz. The Uniden Bearcat 50XL is an economical, handheld scanner with 10 channels covering ten frequency bands. It features a keyboard lock switch to prevent accidental entry and more. Also order part # BP50 which is a rechargeable battery pack for \$14.95 or the new double-long life battery pack part # BP55 for \$29.95, a plug-in wall charger, part # AD100 for \$14.95, a carrying case part # VC001 for \$14.95 and also order optional cigarette lighter cable part # PS001 for \$14.95.



MODEL TS-2



MODEL HX 1500

NEW! Scanner Frequency Listings

The new Fox scanner frequency directories will help you find all the action your scanner can listen to. These new listings include police, fire, ambulances & rescue squads, local government, private police agencies, hospitals, emergency medical channels, news media, forestry radio service, railroads, weather stations, radio common carriers, AT&T mobile telephone, utility companies, general mobile radio service, marine radio service, taxi cab companies, tow truck companies, trucking companies, business repeaters, business radio (simplex) federal government, funeral directors, veterinarians, buses, aircraft, space satellites, amateur radio, broadcasters and more. Fox frequency listings feature call letter cross reference as well as alphabetical listing by license name, police codes and signals. These Fox directories are \$14.95 each plus \$3.00 shipping. State of Alaska: RL019-1; State of Arizona: RL025-1; Baltimore, MD: Washington, DC: RL024-1; Buffalo, NY: Erie, PA: RL009-2; Chicago, IL: RL014-1; Cincinnati: Dayton, OH: RL006-2; Cleveland, OH: RL017-1; Columbus, OH: RL003-2; Dallas/Ft. Worth, TX: RL013-1; Denver/Colorado Springs, CO: RL027-1; Detroit, MI: Windsor, ON: RL008-3; Fort Wayne, IN: Lima, OH: RL001-1; Hawaii/Guam: RL015-1; Houston, TX: RL023-1; Indianapolis, IN: RL022-1; Kansas City, MO: KS: RL011-2; Long Island, NY: RL026-1; Los Angeles, CA: RL016-1; Louisville/Lexington, KY: RL007-1; Milwaukee, WI/Waukegan, IL: RL021-1; Minneapolis/St. Paul, MN: RL010-2; Nevada/E. Central CA: RL028-1; Oklahoma City/Lawton, OK: RL005-2; Orlando/Daytona Beach, FL: RL012-1; Pittsburgh, PA/Wheeling, WV: RL029-1; Rochester/Syracuse, NY: RL020-1; San Diego, CA: RL018-1; Tampa/St. Petersburg, FL: RL004-2; Toledo, OH: RL002-3. Regional directories which cover police, fire ambulance & rescue squads, local government, forestry, marine radio, mobile phone, aircraft and NOAA weather are available for \$19.95 each. RD001-1 covers AL, AR, FL, GA, LA, MS, NC, PR, SC, TN & VI. RD002-1 covers IL, IN, KY, MI, OH & WI. New editions are being added monthly. For an area not shown above call Fox at 800-543-7892 or in Ohio 800-621-2513.

Regency® HX1500-LA

List price \$369.95/CE price \$224.95. 11-Band, 55 Channel • Handheld/Portable. Search • Lockout • Priority • Bank Select. Sidelit liquid crystal display • EARMON Memory. Direct Channel Access Feature • Scan delay. Bands: 29-54, 118-136, 144-174, 406-420, 440-512 MHz. The new handheld Regency HX1500 scanner is fully keyboard programmable for the ultimate in versatility. You can scan up to 55 channels at the same time including the AM aircraft band. The LCD display is even sidelit for night use. Includes belt clip, flexible antenna and earphone. Operates on 8 1.2 Volt rechargeable Ni-cad batteries (not included). Be sure to order batteries and battery charger from the accessory list in this ad.

Bearcat® 100XL-LA

List price \$349.95/CE price \$194.95/SPECIAL 9-Band, 16 Channel • Priority • Scan Delay. Search • Limit • Hold • Lockout • AC/DC. Frequency range: 30-50, 118-174, 406-512 MHz. The world's first no-crystal handheld scanner now has a LCD channel display with backlight for low light use and aircraft band coverage at the same low price. Size is 1 1/4" x 7 1/2" x 2 1/4". Included in our low CE price is a sturdy carrying case, earphone, battery charger/AC adapter, six AA Ni-cad batteries and flexible antenna. Order your scanner now.

*** SPECIAL SAVINGS COUPON ***

Save even more with this special coupon. As long as your order is prepaid with a money order, you'll get extra special pricing on items listed in this coupon. This coupon must be included with your prepaid order. Credit cards and quantity discounts are excluded from this offer. Offer valid only on prepaid orders mailed directly to Communications Electronics Inc., P.O. Box 1045 - Dept. M1, Ann Arbor, Michigan 48106-1045 U.S.A. Coupon expires June 15, 1987. Coupon may not be used in conjunction with any other offer from Communications Electronics Inc. Be sure to add shipping & handling fees listed in this ad.

RH250B-M1 Regency 25 W. VHF Transceiver...\$299.95
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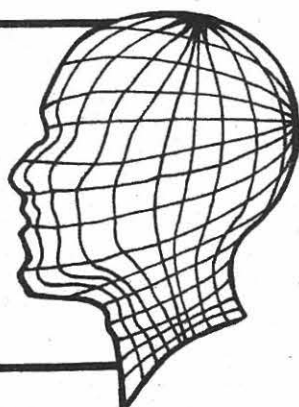
New AR-2002 Scanner Dropped by Grove

We have received word from ACE Communications, importer of the AOR AR-2002, that Regency Electronics is seeking an injunction against the importation of the new scanner.

Because of continual delays and non-receipt of promised shipments, Grove Enterprises has cancelled all remaining AR-2002 orders placed with ACE and has notified customers that their orders cannot be filled.

Profile:

RADIO JAPAN



There was a time when Radio Japan was a mere 20 kilowatt station -- hardly worthy of mention considering the awesome power of today's transmitters. But that was fifty-two years ago and today, Radio Japan is itself one of the giants. Three hundred kilowatts is the name of the game for RJ today.

Radio Japan is the overseas service of NHK, the letters of which stand for Nippon Hoso Kyokai, or, in English, the Japan Broadcasting Corporation. NHK is the oldest broadcasting organization in Japan and remains the only public broadcaster in the country.

Shortwave broadcasting began in 1935 as Radio Tokyo but that service was suspended following the defeat of Japan in World War II. It wasn't until 1952 that international broadcasting resumed. When it did, there was a name change as well, to the present day "Radio Japan."

In addition to the international shortwave service, NHK operates two television channels and two AM and one FM radio channels which ensure domestic coverage of the islands. Radio Japan also launched a broadcasting satellite, the first in the world, in January of 1984 for television programming.

NHK continues to broadcast varied programming to promote international understanding of Japan and offers programs of outstanding quality to more than 150 million listeners.

Radio Japan broadcasts more than 1,600 programs a week. To ensure trouble-free operations for all 21 language services and transmission directions, a computerized automatic transmission system exists at the NHK headquarters in Tokyo. Programs are then beamed via the transmitting station in Samata Town.

PROGRAMMING

Shortwave programming is divided into General and Regional Services. The General Service is directed toward the world at large and broadcasts for a total of 18 hours daily in Japanese and English. The Regional Service is directed toward specific areas, such as North America or Europe, for 22 hours a day.

Of interest to many listeners are the extensive range of programs from Radio Japan. One popular feature, "Let's Learn Japanese," is a basic language course. In response to the popularity of the Japanese language abroad, the program is now heard in all Radio Japan foreign language services. Text books are even provided to assist the listener with his or her studies.

Each Sunday evening, NHK presents a weekly magazine program tailored for the area it is beamed to. It might take the name "Hullo America," "Hullo Australia" or "Hullo from Tokyo," but it all means the same thing -- listener letters. Questions are answered and music request played. Interviews featuring topics

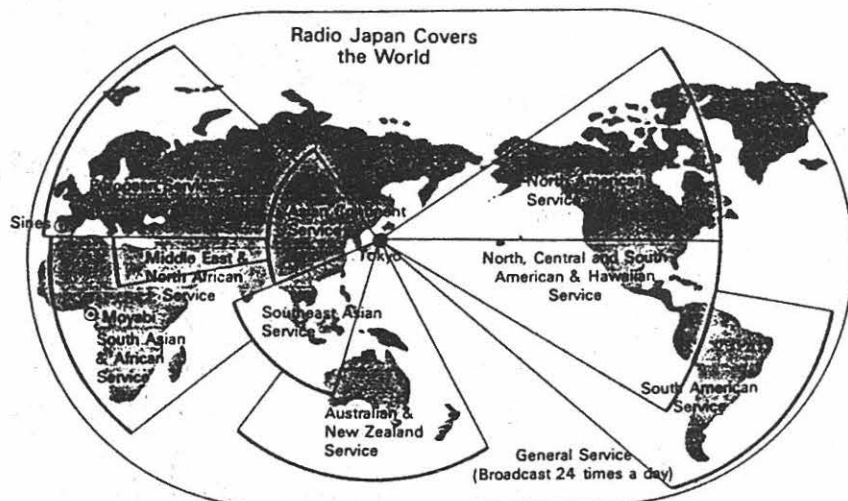
related to target areas are also included.

DX Corner is also very popular with shortwave listeners around the world. Japanese DX Club activities are introduced and "ABC of DXing" is a segment for beginners. Reception reports are also answered during the program.

Japan's economic rise in the world has drawn curiosity about the culture of the country and Radio Japan attempts to satisfy that need with a number of program, including "Meet the People," "Japan Travelogue," "Japan Panorama" and "Our Heritage," a sometimes very scholarly history program. All of these programs present an informative look inside Japanese society.

Sadly, although it was once a strong supporter of the idea of providing advance program details to publications and listeners, the station has apparently changed its policy, saying that it does not produce its programs in advance.

But what about news, you ask? Even the shortwave radio doesn't provide a lot of strong signals from Asia. Radio Japan comes to the rescue. News and commentary make up more than 60% of the programming. As Asia's key station, Radio Japan places special emphasis on news of this region. And NHK's network of overseas correspondents are well-respected for their lively coverage of the region in the "Asia Now" news

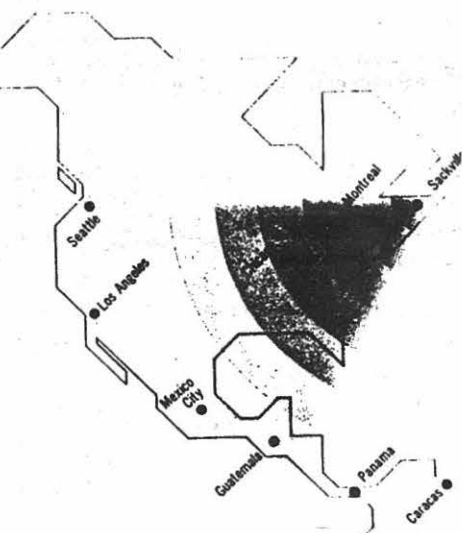


program. Many press organizations and listeners consider Radio Japan to be one of the most reliable sources for accurate and impartial news coverage of Japan and Asia.

Part of Japan's proud heritage is its music. The "Japan Music Scene" is a 20 minute DJ type program that's broadcast on the General Service at 0715, 1115, and 2315 UTC every Friday. And each week, the program deals with a different musical theme. One recent program covered the "Songs Relating to the Northern Region of Japan" but other shows have featured music as widely diverse as Heavy Metal and Reggae.

GETTING THE SIGNAL

In addition to transmitting from Japan, NHK -- since October of 1979 -- has relayed its broadcasts for an hour through Radio Trans Europa in



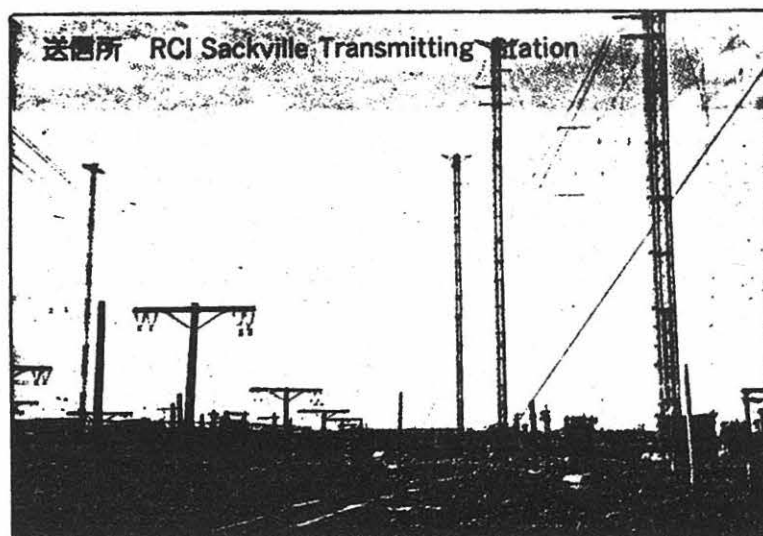
VERIFICATION CARD

Thank you very much for your reception report on our broadcast.
The information given is in accordance with our schedule.
We hope you will continue to enjoy our programmes and send us your thoughts about them.

受信報告ありがとうございました。内容はラジオ日本の放送と合致しております。これからも番組についてのご感想をお寄せ下さい。

RADIO JAPAN
NHK TOKYO 150, JAPAN

Sample



Sines, Portugal. The transmissions are beamed at the Middle East and Europe.

For listeners in Europe and the Middle East, Radio Japan opened another relay, this time in Moyabi, Gabon [in west Africa]. For six hours a day, Radio Japan's programs are carried over the state-owned Moyabi Transmitting Station, just southeast of Libreville, the capital of Gabon. Radio Japan sends its programs to both sites via the Intelsat communications satellites over the Indian and Atlantic Ocean.

But the most important new relay for Japan has come only recently. And that relay has opened up a whole new world of listeners for the station. The relay is Radio Canada International. Programs are transmitted, once again, through the Intelsat satellite to Vancouver in British Columbia and via Canadian Broadcasting Corporation [CBC] facilities to the Radio Canada International transmitters in Sackville, New Brunswick. From there, the broadcasts are transmitted to the east coast of North America. Programs are heard for one hour daily, starting at 1330 UTC on 6120 kHz. Although early morning for the North American, it's evening in Japan and as a result, NHK's news is broadcast live.

An additional transmission via Radio Canada International will be announced soon.

Radio Japan is one of the best verifiers in Asia - definitely worth the IRC's

REPORTING IN

Now that you're ready to hear Radio Japan, what about reception reports? NHK welcomes your reports and are some of the best verifiers in Asia. Station schedules and literature are usually included in the reply. QSL cards are full color and feature wildlife, crafts, scenery, and items of Japanese culture.

One recent change in their QSL policy has been the introduction of the "no data," thank you for your report" cards. Some listeners find this method somewhat impersonal, but an increasing number of international stations are using this "no hassle" card.

And so, you are now prepared to tackle the land of the cherry blossom. Whatever your listening pleasure -- news, music or features -- Radio Japan offers it all. Why not give it a try and enjoy a look at Japan as only shortwave can bring.



Japan Radio studios

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- TOTAL COST OF THESE OPTIONS IS \$315.00**
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R71A 24 hour tested no mods... **CALL**
FREE: One year Option-Purchase R71A from EEB (Call for Price) and you have 1 year to upgrade to the High Performance configuration.

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- Scan in steps of 5, 10, 12 1/2, 25 and 100 KHz. Store any frequency and related operating mode into any of the 99 memories. Scan the memories. Or in between them. Or simply "dial up" any frequency with the frequency entry pad.
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Making Waves

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Paul Swearingen
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Panorama City, CA 91412

AMs, FM's, and TV's for DXing

In my January column, I attempted to list my top choices in DX-quality radios. While I restricted myself to models currently on the market, two readers reminded me that several portables not currently in production might turn up in the want ads or at flea markets. And indeed, if you know what to look for, you can come away with some excellent values.

Dxer Ruth Hesch, who lives in White Plains, New York, has been very satisfied with her Sony ICF-S5W, a radio which was in production up until about 1984, I believe. It's a book-size portable, a little over two inches thick, with AM and FM bands, LED tuning indicators, external antenna and ground jacks, and a unique rotating AM zone dial showing call letters in ten zones in the U.S. (The Japanese version, of course, included a rotary dial with Japanese stations as well as crystal-controlled domestic shortwave frequencies.)

Sony tested this set in an interesting manner by making it available to about a dozen DXers across the U.S. in 1981 and then soliciting their comments. I was lucky enough to be a tester when I lived in Kansas and was very impressed with my sample set on both the AM and FM bands. However, like many super-sensitive portables, it tends to overload on both the AM and FM bands in the presence of strong signals. But in adjacent channel rejection, it outperformed my HQ-180. If you're lucky enough to find one, you'll pay about \$40-\$50. No, mine is NOT for sale!

William Rogers, Jr. of Mount Pleasant, Michigan, seconds my good opinion of the GE Superadio for both AM and FM DXing, but he still prefers his Panasonic RF-2200, which includes shortwave coverage from about 4 MHz to 28 MHz. Yes, indeed, and the RF-2200 in the opinion of many DXers is even preferable to the later 2600 and 2900 models, even with their digital readouts. About \$125 should set you up with this one.

Sony marketed their ICF-5900W to compete with the 2200, and some DXers give it a slight edge on SW and AM, although its tuning system can be a little tricky. You can find it for about the same price.

I think I made fun of \$30 portables as DX machines, but Radio Shack sold two "TRF's" (12-655 and 12-656) for just about that price. I added an S-meter to mine and a more accurate slide rule dial, and I ended up with a premier DX machine. This Taiwanese-made AM-only portable occasionally pops up for around \$25 in DX publications, but most DXers are holding on to theirs as a back-up set.

The best and cheapest I've saved for last, and thanks to Bill Rogers for reminding me -- car radios! He touts his GM Delco. And what other radio has to work in a high-static, dusty environment, handling shocks and constant vibrations? The best ones were manufactured in the mid- to late 60s, probably. I have a Motorola that I pulled from a wrecked 1965 Dodge which will rival my HQ-180 in performance when I jury-rig it to a 12 volt power supply, antenna and a speaker. Grundigs, from VWs, and Nationals, from late 70s Toyotas, also seem to be excellent performers.

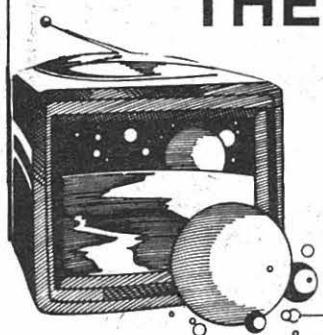
After-market rigs are to be avoided like last year's cliché, however. Avoid also AM/FM/cassette combos, digital tuners, and 6 volt radios. If you feel like visiting a junk yard for one of these, don't pay more than \$15 unless you're feeling charitable. And get a money-back guarantee in case it doesn't turn out to be a DXer's delight.

An excellent article concerning using these radios as the basis of a table top radio appeared in the November-December 1976 issue of *Elementary Electronics*. Your local library should have a copy on hand.

But Why Stop There?

What about FM stereo receivers and television sets for DXers? People DX FM and TV, too, you know! Outside of the portables I've already mentioned, we have to look at more expensive FM rigs for DX-quality radios. And even here, most DXers don't agree. The Akai AT-V04 seems to be the favorite, along with top-of-the-line models from such manufacturers as McIntosh, Yamaha, and Sherwood. I'll put my Sharp FV-610 portable (with stereo headphone capability) up against nearly any of them, however.

THE OUTER LIMITS



Dr. John Santosuosso
P.O. Box 1116
Highland City, FL 33846

Scott McClellan
P.O. Box 982
Battle Creek, MI 49016

The McClellan Report

Over the holidays, pirate activity traditionally picks up a bit and this year was no exception -- especially at the top end of the AM band.

Craig Grizzelford reports hearing Free Radio 1615 on 1616 kHz, Twilight Radio on 1620, the Mystery Airchecker playing tapes of WABC on 1625, and WHOT on 1629 kHz, all simultaneously January 1st around 0500 UTC. And I heard WKUE on 1630 kHz at 0538 UTC, covering WHOT here. So it all goes to show. If you attend New Year's Eve parties, take along a portable receiver and catch the action!

North Carolina's Ben Cole caught a broadcast from Radio Clandestine on 7375 kHz at 0545 UTC with lots of funny programming. He noted music by Weird Al Yankovic, among other off-beat artists. Radio Clandestine can be contacted, as usual, via P.O. Box 982, Battle Creek, MI 49016. Enclose three first class stamps to cover costs.

The Voice of Communism, that uproariously entertaining Radio Moscow parody, has struck again! James Snyder of Illinois logged them on 7491 kHz at 2230 UTC with a good signal. They featured the "great debate" -- an American and a Russian trading humorous facts about their respective countries.

Joe Wosik of Illinois also heard a Voice of Communism transmission, on 7525 kHz at 2242 UTC. He reports the frequencies they use

And as for TV receivers, there seems to be little agreement as to which one performs the best, perhaps because the choice of antennas is more critical to the tropo DXer -- and for the E-skip, any coat hanger will do! I'd appreciate input from MT readers as to their choice of TV sets for DXing.

What to do when you're inside an all-metal camper and can't pull in a signal when you're in the boonies? I'll have the answer next month, thanks to a suggestion from a Las Vegas reader. And who will be the farthest-west DXer to hear CJFT-530? We'll stay on top of the situation! Until the next time, 73. ■

announced as 1616, 1620, 3220, 3272, 3280, 7370, 7375, 7430, 7490 and 7510 kHz. You can write to the Voice of Communism at the Battle Creek address listed above, but the station has not been known to QSL.

Pirate BBS

Do you have a computer with a modem? If so, and you'd like more information about pirate broadcasters, as well as all other shortwave-related activity, try calling the A*C*E BBS. It's one of the most active radio BBS systems going, and it operates at either 300 or 1200 baud. The number is 913-677-1288, 24 hours a day. Give it try and you'll be glad you did. Tell the sysop you read about it in *Monitoring Times*.

Until the next time, good listening!

Dr. John Santosuosso was on special assignment this month. His article can be found on page 11 of this issue. He will return to Outer Limits next month.

Radio Recon Teams Tip the Balance

Special units of the U.S. Navy and Marine Corps are cooperating in an advance intelligence-gathering effort to determine the enemy's radio capability. Infiltrating enemy lines before an American attack, specially trained personnel carrying small radios and direction finders monitor wide swaths of spectrum to find clusters of radio signals in use by the adversary forces.

The six-member radio reconnaissance teams (RRTs) relay the information back to headquarters by voice and data via a secure AN/PSC 3A shore-to-ship terminal where it is analyzed for countermeasures techniques.

The equipment used recently during exercise SOLID SHIELD included Regency MX5000 programmable scanner and Ocean Applied Research (OAR) 3045 radio direction finder coupled with a MA-379 Doppler-switched VHF/UHF antenna cluster. (Article forwarded by Zel Eaton, Kirksvill MO)

MT

UTILITY



Don Schimmel
516 Kingsley Road SW
Vienna, VA 22180

The Beacons Signal

Bob Doyle, Connecticut, reported hearing three beacons on 316 kHz at 1840. He heard OP Old Field Point Light Station, NY; SP Stratford Point, CT; and XR Execution Rocks, NY. By the way, for those who may not know, beacon identifiers are not to be found in the ITU Call Sign Allocations. There are two publications available that contain listings for U.S. and foreign beacons and they are: *Radio Beacon Handbook*, Tochimczyk; *The Aero/Marine Beacon Guide*, Ken Stryker. The first book costs \$14.95 and is available from various MT advertisers. The second title can be ordered from Ken Stryker, 6350 N. Hoyne Avenue, Chicago, IL 60659; it costs \$10.00.

Fax Mods?

Ed Cummings, Pennsylvania, dropped me a note saying he

wondered if any readers had modified any of the various models of QWIP facsimile machines. Ed speculated that with the development of the new digital Fax machines there would probably be lots of the older types showing up at flea markets/hamfests and perhaps some users had come up with some clever approaches to converting the older models so they could be used for shortwave facsimile signals.

If any of you have successfully modified one of the QWIP facsimile machines, let me know and the details can be carried in a future issue of MT.

Computations

To all those readers who have sent computer programs to me, I wanted to let you know that I appreciate receiving them but there just simply is not room in the column to include lengthy program listings.

The program that follows, however, is a very short one and, while designated for the Atari 800XL, I believe those with programmer capabilities can easily modify it program for your particular brand of computer.

This program was contributed by Ron Seymour, Missouri, and he uses it for storing data on loggings he has obtained from monitoring or from loggings listed in magazines.

```
1 REM "UTILITY LOGS FROM
  MAGS & SELF"
10 DIM N$(28), D$(28), T$(82)
20 PRINT "CALL"; INPUT N$
30 RESTORE
40 READ D$, T$
50 IF N$=D$ THEN PRINT
  :PRINT D$, T$:PRINT :GOTO
  20
60 GOTO 40
```

That is the search portion of the program. When the program is "RUN," you are asked for "CALL?," meaning call letters you are interested in. The program will then print out those loggings containing the particular callsigns if they are in memory. The logging information is entered as data statements in subsequent program lines as shown in the example which follows:

```
71 DATA EBA, 2812 MADRID
  NAVAL RADIO W/TEST
```

TAPE RYRY 850/100R.
COULD BE 72JKL
72 DATA EGWM, 4171
VITORIA, A SPANISH
TANKER WORKING GKE
PORTISHEAD RADIO,
ENGLAND ARQ
73 DATA PGON, 6530, PACIFIC
LADY, A DUTCH
FREIGHTER
ETC ETC ETC

After each session of entering additional data statements, the ne entries are saved to tape or disk. Or thanks to Ron for sending in th neat little program.

The Joys of SWLing

Patrick Sullivan, Californi contributed some loggings for th "Listener's Log" section and I provided some information c himself and his SWL activities. Hei is what he said in part:

"I am 33 years old and a employed by ABC-Television in th Engineering Maintenance Dept. ar am assigned to Studio Maintenanc on a sound stage that is in operati 12-18 hours a day M-F. The job both demanding and rewarding and enjoy it quite a lot. After long stud hours I like to go home and relax f a couple of hours and monitor tl bands.

"The equipment which enabl

Power Ant III

Wideband Preamplifier for all Frequency Ranges!

The new Grove PRE-3 Power Ant has taken all of the best from its successful predecessors and combined them into one powerful signal booster for scanners, shortwave and longwave receivers, even TV and FM radios!

Equipped with a high gain, low noise, solid state amplifier stage, the PRE-3's front panel control allows custom selection of up to 30 dB amplification!

Two output connections are provided allowing you to use two receivers on one antenna at the same time! All connectors are type F for maximum signal transfer.



USE WITH OUR FAMOUS TUN-3 MINTUNER FOR INCREDIBLE SHORTWAVE/LONGWAVE RECEPTION!

When used with a short indoor or outdoor antenna, the combination Power Ant III and MiniTuner (see page 17) can equal the performance of a full-size outdoor dipole!

Connect the powerful duo to our new ANT-6 Hidden Antenna worldwide shortwave reception you never dreamed possible with such a compact antenna system! And if you now have an outside antenna, connect it to the PowerAnt/MiniTuner combo and stand back as signals pin your S-meter! Don't forget to order the accessories you will need to power the PRE-III and connect it to your antenna and receiver!

Specifications

Gain	30 db @ 1 MHz
.....	29 db @ 10 MHz
.....	27 db @ 50 MHz
.....	21 db @ 150 MHz
.....	13 db @ 450 MHz
.....	10 db @ 900 MHz
Noise figure	2 dB nominal
Usable frequency range	10 kHz-1300 MHz
Input/output impedance	50-75 ohms nominal
Power required	12 VDC @ 40 ma.
	(DC cord supplied)
Connectors	F type
Dimensions	4"W x 2"H x 3"D
Weight	6 ounces



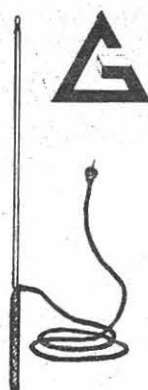
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(UTILITY INTRIGUE, cont'd)

me to follow this hobby is as follows: Icom R-71A, Icom R-7000, Sierra Chapparral Satellite System (C and Ku capable), Info-Tech M-6000 Multimode Code Receiver, Info-Tech M-605 FDM Demodulator, Info-Tech M800 Facsimile Unit, Commodore 64 computer, AEA Pakratt-64, MEC-71 computer interface, Epson FX-85 Printer as well as far too many antennas and little things to include on this list.

"As you can see, I have the facilities to monitor from 100 kHz to 12 GHz and have developed it into quite an operation."

I am sure that readers will agree that Patrick has a very impressive monitoring installation!

Cuban Embassies Worldwide

I just finished updating my information on the Observed Frequencies for the Cuban Diplomatic Service and here is the revised list:

8815	13322	13945	16040	18115
9130	13333	13955	16310	18160
10044	13340	13975	16355	18236
10674	13345	13981	16358	18454
12115	13350	13989	16405	18612
12225	13371	13991	16420	18628
12230	13375	14472	16425	18638
12235	13380	14755	16470	18650
12290	13382	14812	17255	19060
12295	13384	14823	17517	19429
12344	13385	14920	17720	19785
12980	13388	14945	17894	19990
13115	13390	14989	18030	20130
13284	13856	14995	18035	20740
13311	13878	15040	18040	20945
13316	13920	15935	18050	23181
	13940	16010	18112	25041

The transmissions are CW and RTTY (50/425 and 75/425). Callsigns with locations are as follows:

CLP1	Havana, Cuba
CLP2	Panama
CLP4	Guinea Bissau
CLP5	Algiers, Algeria
CLP8	Guinea, Conakry
CLP15	Cotonou, Benin
CLP18	Dar es Salaam, Tanzania
CLP25	Maputo, Mozambique
CLP38	Paramaribo, Surinam
CLP45	Luanda, Angola
CLP55	Georgetown, Guyana
CLP65	Managua, Nicaragua

Mysterious Marker

A letter from Greg Wilson, New Jersey, described the results of some recent monitoring. Here are some extracts from his letter:

"Reference Utility Intrigue, December 86. I am writing today to let you know that I have also intercepted the VK30 marker (callsign sent over and over for long periods) in the 6 MHz band. In addition, I have, within the past several weeks, intercepted activity remarkably similar to VK30--these are:

DATE/FREQ kHz/TIME	CALLSIGN
86-12-06/2355/0335Z	OA01
86-12-08/2380/0035Z	SA03
86-12-08/2370/0115Z	IP15
86-12-14/2365/0040Z	OG17
86-12-14/2335/0215Z	YL13
86-12-15/2390/0355Z	MY11

"All appeared to be tape or computer generated CW in the 5-7 WPM range. No forms of traffic have been noted associated with these callsigns."

Greg also sent along some additional intercepts and I cannot help but wonder if these are somehow connected with the 2 MHz activity he monitored.

DATE/FREQ kHz/TIME	CALLSIGN
86-12-02/3203.7/0505Z	G8T5
86-12-06/2319.7/0330Z	06PU
86-12-14/2320/0029Z	S72X
86-12-14/2285/0245Z	SXGZ*
86-12-15/2320/0245Z	6J3F
86-12-15/3229/0050Z (dual w/2285)	SXGZ*
86-12-18/2320/0440Z	C4SY
86-12-20/2320/0020Z	XGNJ
86-12-21/2320/0110Z	S45Y*

Greg commented "Those marked with an * are extremely interesting for they have occasionally passed traffic--in a most peculiar manner!"

"On 86-12-15 at 0100Z, after a seemingly endless stream of 'SXGZ,' this marker began the following call-up:

SXGZ SXGZ SXGZ DE IGC8 IGC8 IGC8 QTC 11 20 15 0200 BT 543 SXGZ BT VLU UOY DUY etc. (Cut # system?)

"After passing some four messages, the marker returned to 'SXGZ'!"

"The other example, in remarkably similar fashion, changed from a series of 'S45Y' on 86-12-21 at -117Z to S45Y S45Y S45Y DE UP7M UP7M UP7M QTC 15 25 21 9217 BT FOR L6OD BT (into 4-digit cut number groups).

"At the end of several messages, the marker returned to 'S45Y.' From this activity I can make the following assumptions:

■ The marker is designed to identify the receiving station rather than the transmitting station (Ref: callsign change in call-up)

■ With the message time, in both instances, corresponding to UTC +1 hour (msg time of 0217 passed at 0117Z), the originating location is somewhere in the time zone immediately east of Greenwich (a large area, indeed!).

"Don, I haven't seen anything like these before, perhaps you or one of your readers can help me on this one!"

The targets reported on by Greg are similar to some I have observed and most recently I heard OP5Z DE QQLA on 13555 kHz at 0058Z on 25 November and AB5A DE 6UIT on 3028 kHz at 0530Z on 14 December. It is interesting to note that there is some similarity between stations previously reported by Greg (see Utility Intrigue, May 1986) and these current intercepts. Thanks, Greg, for sharing the information with our readers.

"OM" Not Call Letters

Many of you will perhaps recall my mentioning a station which sent OM over and over (see Utility Intrigue, January 1987). Mark

Chinsky, New York, offers some remarks pertaining to this activity:

"For your information, CW station OM does not exist! OM has been mistaken by various utility DXers as a callsign due to the fact that it has been observed on CW point-to-point nets where the stations do not identify by callsigns, as they employ prearranged time/frequency schedules to set up these nets.

"OM is some sort of Russian CW prosign or operating signal which appears to indicate a readiness on the part of a participating station to accept traffic. However, the use of OM by such stations does not eliminate the usage of K therefore OM and K have different meanings.

"I have observed OM used on various Russian military HF-CW nets with their Navy making substantial use of this CW group. I believe that the station you observed on 14445 kHz (DTOI 072136Z OCT 86) is located in Cuba and operates on a HF point-to-point net which terminates in the USSR. By the way, 4654.5, 8002 and 12269 are also Russian military frequencies where OM has been mistaken for a callsign.

"About two years ago, I heard a station on 11555 in CW working RMJU and UXR. RMJU is a Russian warship and UXR is a shore-based radio facility in the USSR. Initially, I heard OM OM followed by what appeared to be callup instructions, so I thought the station's callsign was OM. After listening for several hours, I was fortunate to catch the station send OM OM and then its ITU callsign (CMU967). After months of monitoring various circuits where OM was heard including Soviet Navy (VMF) Fleet CW Nets from RIW (Moscow) and CMU967 (Santiago, Cuba), it became clear that OM is not a radio callsign."

We certainly appreciate Mark furnishing the details of his study of the use of "OM" by the monitored stations.

Unidentified Stations

3074 kHz Dec 200403Z CW

5L groups were passed with Spanish special character Nyeh (MW) noted. The transmit station

(Please turn to page 39)

NOVEMBER 1986 LOGGINGS

KHZ	DTOI	MODE/IDENTIFICATION/COMMENTS
2900	180524	USB/OM-EE receiving position reports from various flights
3072	180530	USB/2OM conversing in Oriental type language
3413.5	090147	USB/OM-EE (British accent) giving WX for Madrid, Lisbon, Santa Maria, etc.
3422	100059	CW/ABA DE DEL, TRU DE WSA (uniden)
3435.6	100054	CW/DE GYA (Whitehall [London] Naval Rdo, England)/QX listing
3460.7	090203	LSB/French language net
6243	041344	CW/BAA DE DEL, ADO DE DEL (Uniden)
8808.5	240015	USB/DE WLO (Mobile, Alabama) with WX for Florida & Gulf area
9122	240008	CW/DE WGY912 (FEMA VIP Relocation Site, Mt. Weather, VA)/5L groups
12135	232352	CW/WX in English for Gulf of Mexico
12360.6	240001	USB/Cruise ship at San Juan PR with phone patch through uniden high seas shore station
12994.1	271414	CW/VV DE VIP04 (Perth, WA, Australia)
13394	271404	RTTY 50-425/DE CLP1 (Havana, Cuba)/5F groups, MFA traffic
13528	201508	CW/No calls/5L groups, 4 spec charac AA IM OE OT/Poss Soviet activity
13814.9	251536	CW/DE KRH50 (US Embassy London)
13821.5	241443	CW/No calls/5-charac grps, cub nbr system--1234567890=AU34567DNT
13878	231644	RTTY 50-170/No calls/5F grps
13885.2	241448	CW/CQ DE TAD (Turkey Alloc) QSY 10638
13893.7	241436	RTTY 50-170/Press in English
13934	221532	CW/CLP23 (Lagos, Nigeria) DE CLP1 (Havana)/PT Mesg in Spanish
13941.3	212121	USB/2 OM conversing in Portuguese
13943.2	231616	CW/VV DE FDY (Orleans Air, France)
13948	061356	RTTY 50-425/German text, appears to be Press items
13963.5	251540	USB/Conversation by 2 OM in Italian
13967.2	212114	RTTY 50-425/Cuban MFA news briefs in Spanish
13984	222203	CW/CLP1 (Havana) wrkg uniden station
13992.7	231838	USB/MARS Tic going to Green Bay, WI
13993.4	232346	RTTY 75-425/Press in English, items all deal with Afghanistan but is odd because all bear September dates??
14391	221615	RTTY 50-170/Arabic text
14440	211715	AM/YL-EE sending 5F groups, she has accent of some sort. Carrier off 1717
14472	241702	CW/Spanish language chatter
14550	201547	CW/DE SPW (Poland Alloc)
14555	232138	CW/Commercial telegrams in Spanish, Cities in Chile in headings
14571.4	221628	RTTY 50-425/Arabic text
14630	232329	CW/Commercial telegram in Spanish, from LPS (Argentina Alloc)
14640	211705	CW/DE EBA (Madrid Naval Rdo, Spain)/5F groups
14721	232131	RTTY 50-425/TNL (Brazzaville, Congo) Testing with RY's
14899.4	232125	RTTY 50-425/Prensa Latina, Cuban Press Agency/Press items in English
14945	202018	CW/CLP65 (Managua, Nicaragua) DE CLP1 (Havana)/QSY 12140, 14945, 13940
14968.1	211925	CW/DE CMU967 (Santiago Naval Rdo, Cuba) 5L grps with 4 spec charac IM OE OT AA, good fist, very fast sending
15704.9	241513	RTTY 50-425/Press in French (MAP - MAGHREB ARABE PRESSE, MOROCCO)
15857.9	241517	CW/DE KNY21 (Yugoslavian Embassy in Washington, DC)
15920	221852	CW/DE CFN (Maritime Command, Halifax, NS, Canada)
16346.5	241536	RTTY 50-425/TASS press items in English, Soviet New Agency
16395	121900	FSK CW/KNY23 (Czech Emb, Wash DC) DE OMZ (MFA Prague Czechoslovakia)/After callup in CW they shifted to RTTY 75-425 and passed 5F groups. Other end possibly on 19453.4.
16400	121841	USB/Several OM in conversation in what sounds like an African language.
16822.3	261453	CW/No calls/Hand sent 4F groups
17025	222145	CW/DE KFS (San Francisco, CA)
17062.4	261501	CW/CQ DE UDE/UBF (Odessa, Ukrainian, SSR)/Traffic list
17189	222200	CW/VV DE LSA (Boca, Argentina)
19108.2	261519	RTTY 45-425/Cuba-Angola link
22389	231626	CW/VV DE FUF (Fort de France Naval Rdo, Martinique)
22587.5	231624	CW/DE WLO (Mobile, Alabama)



Listener's Log

Monitoring Times makes no claims for accuracy on lists submitted to the Listeners Log.

SCANNING CENTRAL VALLEY, CALIFORNIA

Contributed by Kenneth M. Jillson, Coulterville, CA

CODES

- | | |
|--|--|
| 1 At your convenience | 728 Lodi Police Department |
| 2 Urgent | 729 Tracy Police Department |
| 3 Emergency | 730 Manteca Police Department |
| 4 No further assistance needed | 731 Ripon Police Department |
| 5 Stake out, other units stay away | 732 Escalon Police Department |
| 6 Major fire | 733 District Attorney's Office |
| 7 Out of service for meal at _____ | 800 Wagon needed |
| 7C Out of service for meal at home | 800A Wagon enroute to jail |
| 9 Scramble message | 800B Wagon enroute to Detox Center |
| 10 Urgent call pending...no units available | 900 Stand by-emergency, cease transmitting |
| 12 Use of more than one radio chan for patrol dispatch | 901 Vehicle accident, property damage |
| 14 Major disaster basis, all agencies activated | 901A Vehicle accident-injury |
| 15 Patrol your assigned area and report extent of damage | 901B Vehicle accident, ascertain if ambulance needed |
| 16 Disaster council now in command | 902 Check out |
| 17 Swat call-up | 903 Traffic congestion |
| 17Z Officer hostage | 903A Traffic hazard |
| 20 Notify the news media | 905 Abandoned vehicle |
| 13-10 Air Raid Warning-Yellow | 905B Abandoned bicycle |
| 13-20 Air Raid Warning-Red | 906 Officer welfare check |
| 13-30 Air Raid Warning-White | 907 Officer secure (in reply to 906) |
| 187 Murder | 908 Out of service at _____ |
| 207 Kidnapping | 908C Out of service for coffee at _____ |
| 207A Attempted Kidnapping | 909 In service |
| 211 Robbery | 909A In service on assignment |
| 211SA Strong arm robbery | 910 Powler, outside |
| 211P Robbery in progress | 910A Prowler, inside |
| 211PS Purse snatch | 911 Person shot |
| 220 Rape attempted | 911A Person stabbed |
| 240 Assault | 912 Suspicious person |
| 242 Battery | 913 Suicide |
| 245 Assault deadly weapon | 813A Suicide, attempted |
| 246 Shooting into an occupied building | 914 Call # _____ |
| 261 Rape | 914C Call your home |
| 272 Contributing to minor | 915 Call this radio station |
| 273 Child abuse | 918 Person calling for help |
| 288 Lewd & lascivious conduct | 8918X Woman screaming |
| 314 Indecent exposure | 920 Follow-up investigation |
| 337 Gambling | 922 Drunk |
| 381 Glue or paint sniffing | 923 Begging or mooching |
| 404 Riot | 924 Go to your office |
| 415 Disturbing the peace | 925 Report to Police Dept. |
| 415C Unknown circumstances | 925R Go to P.D., Reports |
| 415E Music or party | 926 Give your location |
| 415F Family fight | 928 Explosion |
| 415J Juveniles | 928A Bomb threat |
| 417 Brandishing | 928B Bomb device found |
| 451 Arson | 928C Explosive or ordnance found |
| 460 Burglary | 929 Fire |
| 461A Auto burglary | 929A Fire-auto |
| 470 Forgery/Stolen document | 929B Fire-brush |
| 476A Bad checks | 929G Fire-grass |
| 480 Bit & run-Injury | 929II Fire-house or structure |
| 481 Hit & run-Misdemeanor | 929I Fire-illegal burning |
| 484 Petty theft | 929L Car leaking gasoline |
| 484B Petty theft-bicycle | 930 Smoke investigation |
| 484G Petty theft-gas | 930A Gas investigation |
| 487 Grand theft | 931 Injured person |
| 496 Receiving or possession stolen property | 931A Sick person |
| 502 Drunk driving | 932 Drowning |
| 537 Defrauding innkeeper or restaurant | 933 Alarm sounding |
| 594 Malicious mischief | 933211 Hold up alarm |
| 597 Cruelty to animals | 933460 Burglar alarm |
| 601 Out of control juvenile | 933T Alarm test |
| 602 Trespassing | 935 Traffic stop |
| 647 Vagrant | 936W Warrant service |
| 647B Prostitution problem | 937 Check on _____ |
| 647F Drunk in public | 938 Cancel your last assignment |
| 653M Malicious telephone calls | 939 Tow truck needed |
| 710 Time check | 940 Meet an officer |
| 711 Report to firing range | 940A Officer needs help |
| 715 City photographer needed | 941 Citizen holding prisoner |
| 717 City fingerprint man needed | 942 Pick up _____ |
| 721 Contact County Hospital | 943 Fight (battery) no weapons involved |
| 723 Mens jail | 944 Busy, stand by unless urgent |
| 724 Honor farm | 945 Ambulance needed |
| 725 Womens jail | 945M Medics needed |
| | 949 Investigate suspicious occupants of car |
| | 949A Leaving car to check auto, dispatch car to cover if not heard from in reasonable time |

- | | |
|--|---|
| 950 Obtain a report | 951 Check on conditions |
| 953 Man down | 955 Animals straying |
| 955A Vicious animal | 955B Noisy animal |
| 955C Injured animal | 955D Dead animal |
| 955E Animal bite | 955F Sick animal |
| 955G Pick up animal | 955H Cock or dog fight |
| 955J Bees swarming | 956 Illegal Peddling |
| 957 Discharge of firearms | 957B BB guns |
| 958 Improper garbage/trash disposal | 959 Malicious mischief |
| 960 Trespassing | 961 Broken window |
| 962 Meet a citizen | 963 Ball playing in the street |
| 965 Lost person or missing | 965A Lost child or missing |
| 965B Found person or child | 967 Check lights, traffic or street |
| 969 Lines down | 969A Poles down |
| 969B Trees down | 970 Auto improperly parked |
| 970A Auto/Parked on sidewalk | 970B Auto improperly parked in driveway |
| 970C Auto improperly parked in restricted zone | 972 Possible dead body report |
| 974 Deputy D.A. needed | 976 Subpoena detail |
| 977 Check barricades | 977A Check on open ditch |
| 986C Repeat message just sent by _____ | 986D Deliver message |
| 987 Arrived on scene of last detail | 987A Party gone on arrival |
| 987C Prisoner(s) in custody | 987G No report |
| 988 Havy you anything for me? | 989 Return to beat assignment |
| 990 Be on the lookout for _____ and/or attempt to locate | 992 Advise when the detail is completed |
| 1000 Plane crash | 4000 Convoy or escort |
| 4000B Convoy or escort bank or money | 4000F Convoy or escort funeral |
| 4532 Prison or jail break (or juv.hall) | 5150 Mentally disturbed person |
| 10851 Stolen vehicle | 10851A Misplaced vehicle |
| 10851R Stolen vehicle recovery | 10852 Car clout |
| 11300 Narco. violation | |

- | | |
|---------------------------|---|
| 22350 Speeding | 10-4 Acknowledge receipt of message |
| 22500 Parking violation | 10-28 Complete registration information |
| 23102 Drunk driving (502) | 10-29 Any wants or stops |
| 23103 Reckless driving | 11-99 CHP officer(s) need help (same as 940A) |

P after any signal denotes in progress
X after any signal denotes female
J after any signal denotes juvenile

POLICE DEPARTMENTS

City of...	
Merced	155.520
Modesto Ch.1	460.375
Modesto Ch.2	460.500
Los Banos	154.815
Turlock	158.850
Turlock, Sonora, Tracy	458.875
Newman, Ceres	158.805
Manteca/153.950	159.150
Manteca/460.475	154.755
Stockton Ch.1	460.400
Stockton Ch.2	460.250
Stockton Ch.3	460.075
Sonora	154.100
Sonora Dispatch	153.800
Napa	153.980
Napa	153.430
Mendota	45.080
Atwater	154.725
Livingston	155.685
Gustine	155.895
Chowchilla	45.740
Riverbank	159.090
Fresno Ch.1	154.950
Fresno Ch.2	154.415
Fresno Ch.3	154.830

SHERIFF

County	
Stanislaus Ch.1	159.210
Stanislaus Ch.2	158.730
Stanislaus Ch.3	158.865
Merced Dispatch	154.890
Mariposa	153.995
Tuolumne Ch.1	45.420
Tuolumne Ch.2	45.540
Calaveras Ch.1	45.320
Calaveras Mutual Aid	45.540
Calaveras	45.700
Madera Dispatch	39.420
Madera	45.780

(Please turn to page 58)

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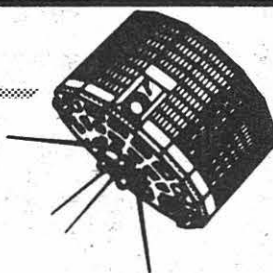
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FAX FACTS

G. P. Mengell
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Rancho Cordova, CA 95670



From the mail I've received to date, the main interest among you seems to be satellite FAX as received by the TIROS and GOES satellites; HF (shortwave) weather facsimile broadcast and press seem to come in third.

These three diverse systems have one piece of hardware that is common to each of them: the display device (i.e., FAX machine). It may be in order to review the various types available.

WHO'S WHO?

Preeminent among American weather FAX vendors is Alden Electronics (Alden Research Center, Westborough, MA 01581; 617-366-8851). They have produced machines for about four decades now, providing engineering quality and willingness to support older machines with parts and servicing (although there is a move away from this tradition at present).

I once heard a weather satellite buff say there were so good they even worked underwater!...Well, almost. The 9244T, 9225 and 9303 units were built rugged and engineered for component longevity. Be sure to get a reconditioned or thoroughly tested machine.

The majority of those machines available at modest cost were made for shortwave use, the 9244-319EA being a very good example. It renders 18-inch-wide WX (weather) maps when used in conjunction with a facsimile tone converter and a short-wave radio.

These devices give excellent definition, are capable of press reception and are fully automatic. The one drawback is weight...all 300 pounds of it. They usually sell (if running) for around \$500 and for HF are an alternative to some of the higher priced gear.

For satellite work, the Alden 9225 is legendary. One starts with the basic recorder (9225E) for TIROS or GOES, the display is on 11 inch paper. I highly recommend these



The legendary Alden 9225E

machines (if pretested as OK).

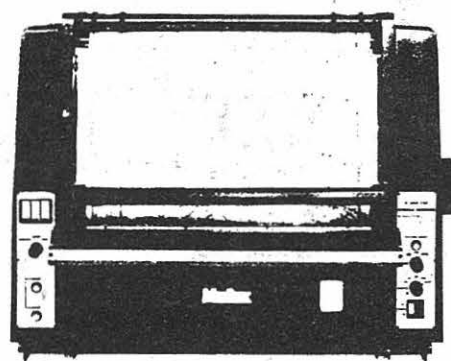
Another appealing feature of the 9225 series is the fact that you can easily fit the entire operation into a 19 inch equipment rack, a table top arrangement or a mobile console on wheels. It is hard to go wrong with this model.

Alden makes another unit called the 9303 which outwardly is nearly identical to the 9225E. It is capable of 60 OPM press as well as 120 OPM (revs) WX and TIROS APT. It is lacking 240 for GOES but should not be overlooked or passed by. There are newer units available but usually the price is prohibitive.

Muirhead Inc. (1101 Bristol Road, Mountainside, NJ 07092; 201-233-6010) is a firm which is long rooted in communications in Europe, helping establish telegraphic routes overseas around the time of Samuel Morse's telegraphic system in the United States. We have mentioned this company before, but it is worth mentioning again, due to the excellence of the product they manufacture.

The machines to look for are the D649 18-inch recorder (tube model) and the K649 (solid state twin). We have a D649 in our office that is probably 20 years old and has required minimal service. The picture quality on HF is second to none. These devices should be the object of a FAX operator's search. The K649 has the advantages of four speeds: 60, 90, 120, and 240 OPM (revs) and the option to electronically enlarge the print. You will not find better machines than these two.

Muirhead also makes such machines as the K550, K500 and K449 as well as business machines. Their ultimate product is the K560 which uses a laser to print on photo



Muirhead's K649-TR4--You won't need a better machine!

paper and then puts the print through an automatic developing process that gives a high resolution photographic print of the received subject matter.

Litton (Litton Amecom, 5115 Calvert Rd., College Park, MD 20740-3898) has also produced many FAX systems over the years; among them have been the RJ4 and UHX-2B carbon-transfer units which are made for HF WX charts.

The TT321 is the next generation of the "unique" TCX single-sheet-per-drum FAX unit (do not buy a TCX whatever the reason!). The TT321 has recorder speeds of 60 and 120 and is a useful TIROS device as it will "write" on xerox paper as well as print with light on photo paper. It will also send.

Litton Amecom has manufactured a machine called the DL-19, an 18-inch recorder which resembles both the Alden and Muirhead units. It was designed to operate at 120 or 240 OPM. Originally used in land-line WX nets, the DL-19 can be ordered with modifications for APT. If you order one, be sure to be specific on what you want it to do. It is a very good machine.

Having described some FAX printers, I would like to add a few words of caution. With the advent of

new technology, there has come glut of office FAX units to the surplus market. Most do not lend themselves to easy conversion--you will usually be money ahead if you steer clear of them.

There are look-alike machine on the market that are set up for 9 and 180 or 30 and 60 OPM. You would be better off passing these by unless you are very technically adept.

While some experimenter have had success with the desk FAX units of years past, with today's requirements these machines of indomitable pluck have finally met their match. A different route should be considered.

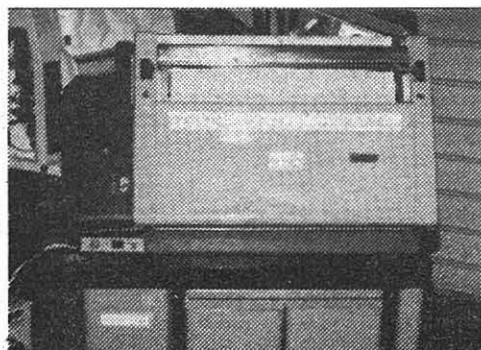
NEW PRODUCTS

There are many new products on the market in the FAX realm. Probably the most bang for your buck can be found in the Info-Tech M-800. When used in conjunction with the Epson LQ800, it is a FAX DXer's dream come true. For \$499.99 for the M-800 and an average price of \$550 for the LQ800 you have the highest quality HF FAX unit available at half the price.

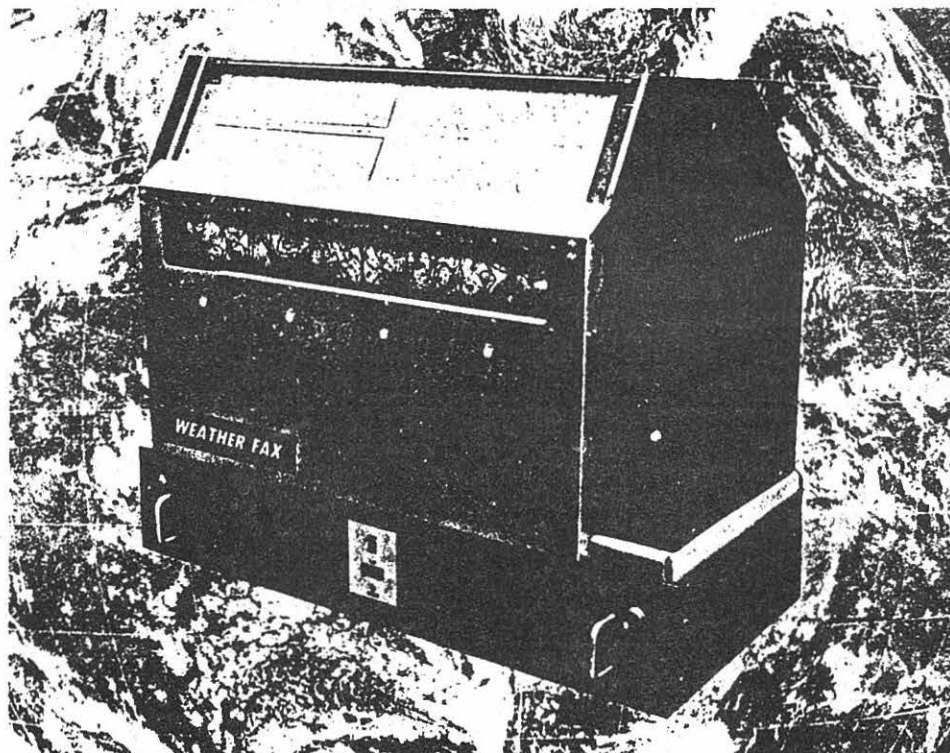
It is workable in the APT/WEFAX mode also, but needs adjustment for optimum performance. There are options planned for this unit which make it even more promising for the future.

With the exception of the LQ800, all these machines take a special type of paper, usually a wet paper with an electrolytic coating that changes shades of gray which correspond with the changes of amplitude voltage; thus, the saying was born, "Electricity is in the ink."

The paper is available for all the above-mentioned machines from Alfax, Inc., or from APT Associates with an MT readers' discount (see ad on p.62). To avoid possible problems with discoloration I would recommend you order the SNA brand.



The rugged Alden 9244T



Litton's RJ4

R Y R Y R Y R Y R Y R Y R Y R Y R Y R Y R Y R Y R Y R Y R Y R Y R

by Daniel Simmons

March 1987

AMVER MESSAGES

by Bert Huneault

Shortwave listeners who monitor ship-to-shore CW in the maritime utility bands often hear the word AMVER used by ships and coast stations. Ever wonder what AMVER is all about? This article will not only answer the question, but will also tell readers how and where to intercept the communications, how to decode these interesting AMVER messages and where to write away for free literature on the AMVER system.

What is AMVER?

An acronym for the Automated Mutual-Assistance Vessel Rescue system operated by the U.S. Coast Guard, AMVER is a maritime program which plays a key role in the development and coordination of search and rescue (SAR) efforts in the oceans of the world.

Merchant vessels of all nations making offshore passages of more than 24 hours are encouraged to send sailing plans (like flight plans for aircraft) and periodic position reports to the AMVER center in New York.

Information from these messages is entered into the AMVER central computer which keeps track of participating vessels during their voyages. Predicted locations of all vessels known to be within a given area are furnished upon request to SAR agencies of any nation during emergencies affecting maritime safety.

The AMVER program benefits shipping by improving the likelihood of rapid aid in emergencies and by reducing the number of calls for assistance to vessels not favorably located. International participation in the program is voluntary regardless of the vessel's flag, country of origin or destination.

There is no charge for AMVER radio messages when they are sent through any one of the dozens of cooperating radio stations that ring the Atlantic and Pacific oceans.

What's in it for SWLs?

AMVER messages contain numerous tidbits of fascinating information for navigation and marine buffs. Even SWLs with little or no nautical savvy will find the communications worthwhile---AMVER messages give the ship's position and, as DX hounds know, it's a lot more fun when you know the QTH of the mobile station whose signals you intercept!

Message Format

There are five types of AMVER voyage reports: Sailing Plan (coded SP), Departure Report (PR), Position Report (also coded PR), Arrival Report (FR), and a Deviation Report (DR) which is used to report changes in the sailing plan.

Regardless of the type of report the message format is basically the same. The first line consists of the word AMVER followed by a single slash (/), the two-letter code indicating the type of message and ends with a double slash (Example: AMVER/PR//).

All subsequent lines begin with a single-letter line identifier, the data items are separated from each other by a single slash (- . . . in Morse code) and each line is terminated by two slashes. The following is a list of line identifiers and their corresponding data:

A/vessel name/radio call sign//
B/date and time//

This six-digit group gives date

of month, hours and minutes followed by either GMT, UTC or Z to indicate Greenwich Mean Time (Universal Coordinated Time). In a Sailing Plan, B indicates the intended time of departure; in a Departure Report, the actual time of departure; and in a Position Report, the time at the specified QTH.

C/latitude/longitude//

These coordinates are expressed in degrees and minutes; latitude is a four-digit group and longitude is a five-digit group. Example: C/3645N/07120W//

E/intended or actual course, in degrees//

i.e. true course expressed as a three-digit group

F/average speed//

This is a three-digit group coded in knots and tenths of knots with the decimal point omitted. For example, F/147// indicates a speed of 14.7 knots.

G/port of departure/latitude/longitude//

These coordinates refer to the geographic position of the pilot station.

I/port of destination/latitude/longitude/estimated time of arrival//

K/port name/latitude/longitude/actual time of arrival//

L/route information//

The L lines contain routing data to each intermediate point or turning point, all the way to the ship's destination. As many L lines as needed may be used. The routing data may contain any of the following: navigation method/leg speed/latitude/longitude/port or landmark name/ETA. The navigation method is either "coastal" or coded GC for Great Circle, or RL for Rhumb Line (a rhumb line is a line that crosses each meridian at the same angle--a constant heading).

M/call sign of the current coastal radio station/next coast station, if

any//
V/onboard medical resources//

This line is usually coded MI for physician, NURSE, PA for physician's assistant, or NC MEDIC in the absence of medical resources.

X/additional remarks//

In addition to the initial AMVER line, the following are the required and optional data lines for each type of AMVER message:

Sailing Plan Report (SP) - required lines: A,B,G,I,L; optional lines E,F,M,V,X

Departure Report (PR) - required A, B, G; optional: E, F, I, L, M, V, X

Arrival Report (FR) - required: A, K; optional: X.

Position Report (PR) - required: A, B, C; optional: E, F, M, X.

Deviation Report (DR) - line A, followed by one or more of the following optional items: B, E,F,G, I, L, M, V, X.

AMVER messages decoded

The following are examples of actual AMVER messages monitored by the writer in recent months. The ships' names, call signs and/or actual data have been changed in order to comply with privacy aspects in Section 705 of the Communications Act.

(a) Sailing Plan Message:

```
AMVER/SP//
A/GLOBAL HIGHWAY/7NKY//
B/190000Z//
G/BALTIMORE/3915N/07632W//
I/NEWARK/4041N/07409W/192000Z//
L/RL/100/3932N/07548W/190500Z//
L/RL/140/3848N/07503W/C.HENLOPEN/
190940Z//
L/RL/170/3848N/074433W/191100Z//
L/RL/175/4028N/07350W/191730Z//
L/RL/100/AMBROSE//
M/WCC//
V/PA//
```

(READING RTTY, cont'd)

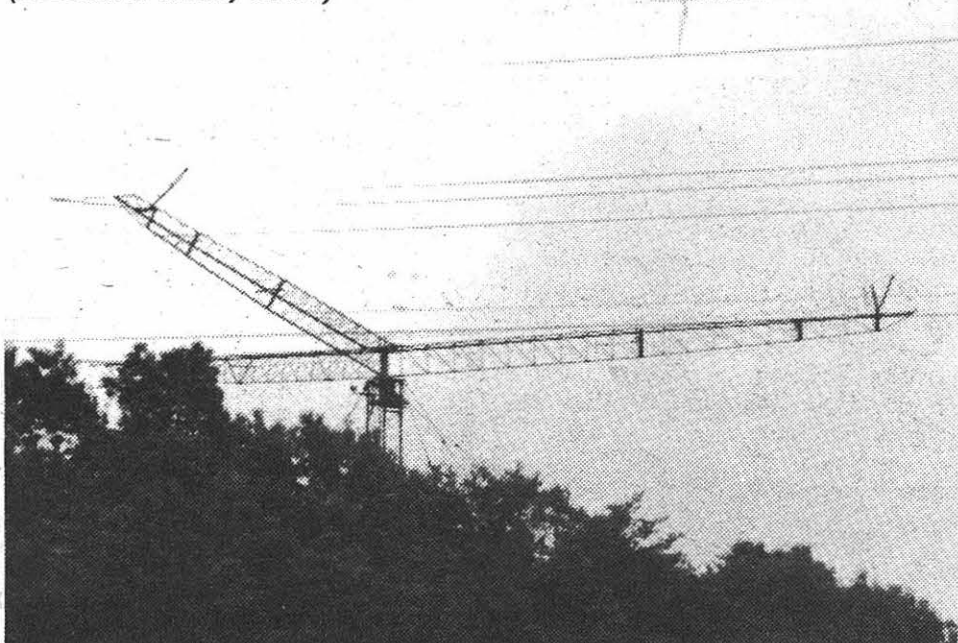


Photo C: Andrews Air Force Base

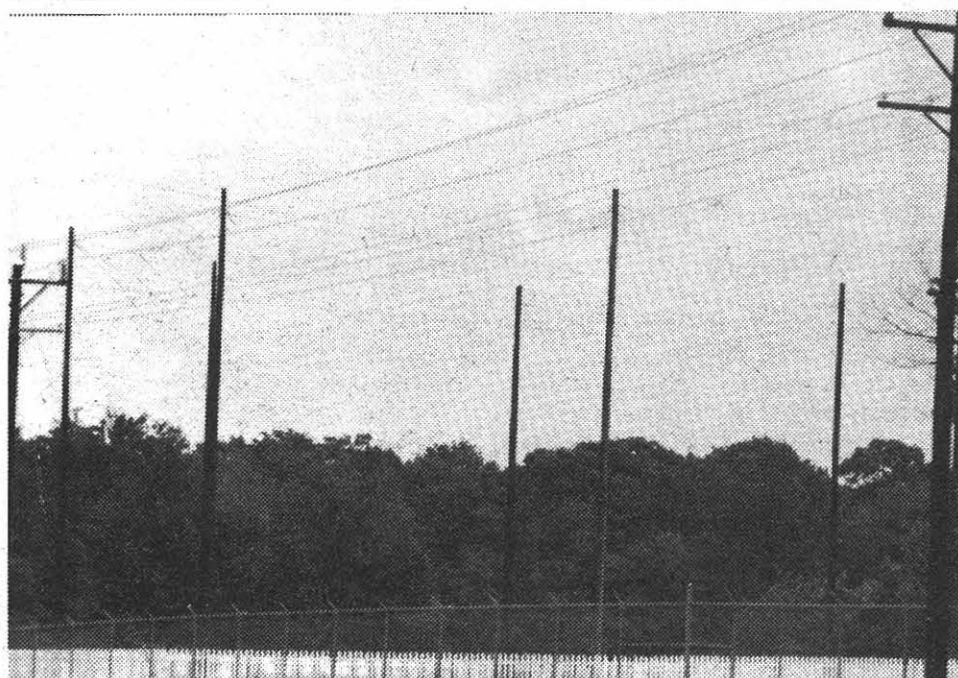


Photo D: Andrews Air Force Base

Decoded, this sailing plan shows that the "Global Highway" -- a Japanese vessel as indicated by its 7N KY call sign -- will be leaving Baltimore on the 19th at 0000GMT. Its destination is Newark, New Jersey, with an ETA of 2000GMT on the same day. The ship will be monitoring coast station WCC (Chatham, MA) and has a physician's assistant on board.

A particularly interesting aspect of this message is the routing information. If someone had asked me how a ship gets from Baltimore to Newark, I would have guessed down Chesapeake Bay to Cape Charles, and then up the Atlantic coast to the Ambrose Channel (gateway to New York and Newark harbors). But the sailing plan shows otherwise.

The fist "L" line shows that the vessel will maintain an average speed of 10.0 knots from Baltimore to position 39 degrees 32 minutes North, 75 degrees 48 minutes West. My geographic atlas shows this position to be on the Chesapeake & Delaware canal.

The route then takes the ship down the Delaware River and Delaware Bay to Cape Henlopen and the Atlantic coast, a saving of some 150 miles compared to my route! Incidentally, notice that once the ship reaches the open Atlantic (after the Cape Henlopen turning point), its speed increases markedly to 17 and 17.5 knots.

Readers interested in following detailed ship routes should have access to nautical charts or to a good atlas such as the National Geographic Atlas of the World, or to Webster's New Geographical Dictionary, a priceless reference in constant use in my radio shack. Such resources can make decoding of AMVER messages real fun if you're into that sort of thing.

(b) Departure Report:

```
AMVER/PR//
A/CONTINENTAL CHARTERER/ELAJ7//
B/021900Z//
G/TAMPA/2756N/08226W//
I/CRISTOBAL
PILOT/0926N/07950W/072230Z//
L/RL/2200N/08511W//
L/RL/2147N/08511W//
L/RL/1539N/08048W//
L/RL/0926N/07956W//
L/COASTAL/CRISTOBAL PILOT//
F/100//
M/VCSS//
V/NO MEDIC//
X/NEXT REPORT 041600Z//
```

Departure reports such as the above are sent as soon as practicable upon leaving port. The writer intercepted this transmission from the Liberian vessel "Continental Charterer" at 2317Z, over four hours after she had left Tampa.

The latitude/longitude of ports of departure and/or ports of destination can be quite helpful at times. For example, for someone who doesn't know where Cristobal -- the ship's destination -- is located, the coordinates of the Cristobal Pilot station stated in the AMVER message pin that QTH down to the

Caribbean Sea entrance to the Panama Canal.

A map check of the turning point data contained in the first couple of "L" lines reveals that the ship will gain access to the Caribbean Sea via the Yucatan Channel between Mexico and Cuba. The radio officer will be guarding coast station VCS during the voyage, and the ship's speed will average only 10 knots...a slow boat to Panama!

(c) Position Report:

```
AMVER/PR//
A/LLOYD ATLANTIC/PPYE//
B/151600GMT//
C/0929N/04605W//
E/143//
F/195//
```

Position reports are the most commonly heard type of AMVER message. In this case, the Brazilian vessel "Lloyd Atlantic" was reporting from latitude 09-29 North and longitude 46-95 West, in the tropical Atlantic, north of Brazil, at 1600 GMT on the 15th. The ship was on a course of 143 degrees (southeast) with a speed of 19.5 knots.

(e) Here's a Position Report message which represents a fairly good DX catch from the writer's QTH:

```
AMVER/PR//
A/AMERICANIS//SXXEE//
B/141300Z//
C/1330S/08706W//
F/165//
M/KFS//
```

The Greek vessel, the Amerikanis, was reporting from the South Pacific, off the coast of Peru, with a speed of 16.5 knots; KFS (San Francisco, CA) was the coast station it was guarding.

Older AMVER Message Format

The above messages were coded in the new AMVER format, in use since about 1984. The older AMVER format is still widely used by many ships, however, so let's take a brief look at the previous format.

There were four types of AMVER messages: type 1 (Sailing Plan), type 2 (Position Report), type 3 (Arrival Report), and type D (Deviation Report).

In these messages, data was transmitted in the following order without slash bars between items:

1. Name of vessel
2. Call sign
3. Type of message
4. Position
5. Date-time
6. Sailing route
7. Speed
8. Destination
9. ETA
10. Call sign of coast station guarded
11. Medical personnel on board

The type of message determines which of the above data are included. For example, the following is a typical Type 1 (Sailing Plan)

message:

```
FUCINATORE IBOF 1 SOUTHWEST
PASS MISSISSIPPI 162000Z RL TO
FLORIDA STRAIT COASTAL TO ABACO
ISLAND RL TO GIBRALTAR STRAIT
13.2 GIBRALTAR 302400Z.
```

Here we learn that the Italian ship "Fucinatore" departing Southwest Pass (Gulf of Mexico) at 20000GMT on the 16th, following a rhumb line course to the Straits of Florida, using coastal navigation to Abaco Island (Bahamas), and rhumb line navigation to the Strait of Gibraltar. The vessel will be maintaining an average speed of 13.2 knots and its ETA at Gibraltar is midnight GMT on the 30th...a two-week voyage.

Communications Procedure

Here's how to monitor AMVER messages: First, dial up one of the International radiotelegraph calling frequencies in the maritime mobile bands, such as 4182, 6273, 8364, 12545, or 16727 kHz. Listen for a ship calling one of the coast stations in the worldwide AMVER communications network.

For North American SWLs, these stations are usually NMN (Portsmouth, Virginia), NMR (San Juan, Puerto Rico), VCS (Halifax, Nova Scotia), NMC (San Francisco, California), NMO (Honolulu, Hawaii) or VAI (Vancouver, British Columbia). Naturally, the time of day, propagation conditions, the vessel's location and radio traffic density usually determine the frequency used and the coast station contacted.

Once radio contact is established, the ship changes to a working frequency, usually up the band. For example, if the ship operator calling a coast station in the 8 MHz band signals QSS 405 (or QSW 405, or UP 405) it means that he/she will use 8405 kHz as a working frequency.

The coast station operator generally replies "UP - - - -", to which the ship operator replies "- - - -". That's your cue to re-tune your receiver to 8405 kHz where, a moment later, you'll hear the ship calling once again. When the coast station signals "QRV - - -" (I am ready, go ahead) the vessel transmits the AMVER message.

Note that in these ship-to-shore communications the coast station uses a fixed frequency which is generally quite a way up the band from the ship's calling and working frequencies. Two receivers come in handy if you want to monitor both ends of the QSOs, but the interesting data is transmitted by the ship, not the coast station.

Free Literature

MT readers may request a free copy of the *AMVER User's Manual* and the latest issue of the *AMVER Bulletin* which lists all the worldwide AMVER coast stations and their

(UTILITY INTRIGUE from page 34)

sent AAA after each ten groups and the other end would tell him to continue by sending EE.

3195 kHz Dec 140533Z CW(Auto-matic)

The message started out QRA DE T4B-P-0140515Z DEC GR 120 BT ARMTD JFKII DJKSD etc etc ARMTD BT AR K K E. There was no operator chatter and the station went down at 0541Z.

1387.5 kHz Dec 221620Z RTTY 50-170

CQ CQ CQ DEDU58 (Followed by QUICK BROWN FOX & RY's) QTC1 DE DU58 PPQ 221335Z GR 060 BT XWQHH 03062/09108 (into encrypted transmission) BT NNNNC E RPT RPT (message repeated) BT AR AR

The message was complete and the station went off the air at 1625Z.

13888 kHz DEC 231612Z CW

No heading noted just the transmission of these three groups: TMA UDWUA AMNAT (repeated over and over).

At 1614Z this transmission stopped and nothing more was heard. The characters appear to be a cut number system with the following probably breakout: 1 2 3 4 5 6 7 8 9 0 = A N D U W R I G M T.

14398.7 kHz DEC 202008Z CW

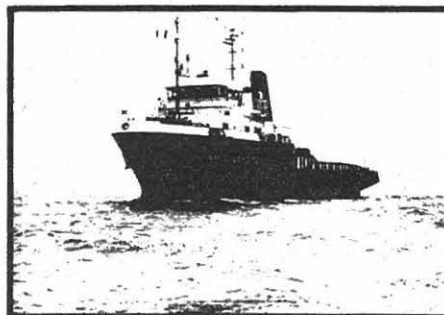
The traffic was hand sent in 5F groups with the zero cut as the letter T. The operator tended to run the characters together thus not always allowing a suitable space after each five characters.

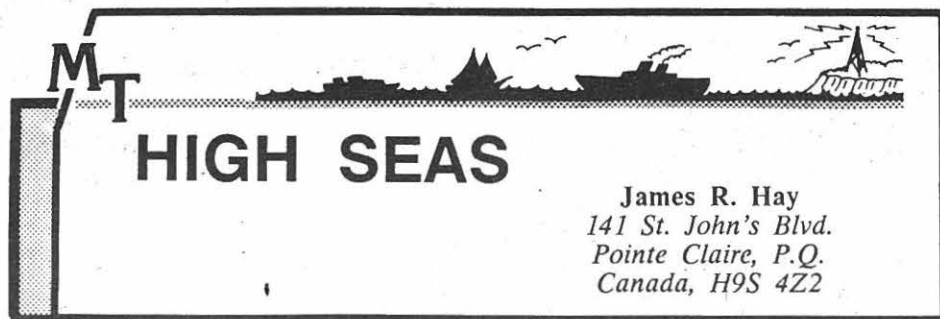
14555.5 kHz DEC 201402Z CW

The message was sent in 5F groups, hand sent, and the operator had a very good fist. The signal was weak and fading somewhat. I did not hear the other end.

working frequencies, by writing to Commander, Atlantic Area U.S.C.G. AMVER Center, Governors Island, New York, NY 10004

If you're a CW buff, try monitoring these AMVER messages they'll give an additional dimension to your SWL hobby.





CHESAPEAKE BAY

This month Chesapeake Bay is our subject of attention. To start, many readers know that Norfolk is a very busy naval center, but apart from military frequencies, other channels have something to offer as well.

156.700	WNU 615	Virginia Pilot Association	Cape Henry Light, VA
156.600	WHD 692	Virginia Marine Rescue	Fairport, VA
156.425	KFH 494	Gloucester Electronics	Gloucester Point, VA
156.425	KYU 618	Hampton Roads Marine	Hampton, VA
156.450	KSK 243	Teledyne Inc.	Hampton, VA
156.600	WHD 691	Virginia Marine Rescue	Hampton, VA
156.450	WEC	Allied Towing	Norfolk, VA
156.450	WHD 577	Amirang Ship Supply	Norfolk, VA
156.500	WHD 676	Central Radio Co.	Norfolk, VA
156.450	KKJ 743	Exxon Communications	Norfolk, VA
156.450	KPB 562	Hampton Roads Maritime Ass'n	Norfolk, VA
156.500	KIE 824	McAllister Brothers	Norfolk, VA
156.975	KFN 206	Nrflk Baltimore Carolina Lin	Norfolk, VA
156.425	KIZ 664	Rebel Marine Services	Norfolk, VA
156.975	KIZ 664	Rebel Marine Services	Norfolk, VA
156.500	WHG 934	Rice Unrun Co.	Norfolk, VA
156.450	WQX 655	Sea-Air Services	Norfolk, VA
156.975	KPB 575	Seanan of Norway Inc.	Norfolk, VA
156.900	WQD 419	Shawna Launch Service	Norfolk, VA
156.600	KIA 270	Shawns Launch Service	Norfolk, VA
156.900	KIA 270	Shawns Launch Service	Norfolk, VA
156.425	WQD 391	Shore Drive Marina	Norfolk, VA
156.450	WHG 500	Harbour Tours	Portsmouth, VA
156.900	KPB 677	Tidewater Yacht Agency	Portsmouth, VA
156.425	KPB 677	Tidewater Yacht Agency	Portsmouth, VA
156.600	WQZ 487	Chesapeake Launch Service	Virginia Beach, VA
156.600	KPB 553	Lynnhaven Services	Virginia Beach, VA
156.600	WQD 419	Shawna Launch Service	Virginia Beach, VA

Apart from the Norfolk area, Annapolis and Baltimore will also offer something for the maritime enthusiast.

156.425	WHU 521	Annapolis Bay Charters	Annapolis, MD
156.575	WQZ 323	Annapolis Boat Rentals	Annapolis, MD
156.425	WNU 374	Annapolis City Marina	Annapolis, MD
156.425	KGA 483	Bay Country Electronics	Annapolis, MD
156.450	WRV 525	Cape and Caribbean Charters	Annapolis, MD
156.900	WQZ 375	Chesapeake Marine Towing	Annapolis, MD
156.425	WAB 951	Electronic Marine	Annapolis, MD
156.500	WAB 955	Electronic Marine	Annapolis, MD
156.500	WQX 605	Int'l Marine Transportation	Annapolis, MD
156.425	KYU 825	Marine Communications	Annapolis, MD
156.450	KYU 825	Marine Communications	Annapolis, MD
156.425	WQB 599	Maryland Capital Yachts	Annapolis, MD
156.425	WQZ 478	Seyern Sailing Association	Annapolis, MD
156.425	KTR 951	Yacht Basin	Annapolis, MD
156.500	KLU 805	Baker Whiteley Towing	Baltimore, MD
156.700	KLU 805	Baker Whiteley Towing	Baltimore, MD
156.500	WQB 630	Baltimore Gas and Electric	Baltimore, MD
156.500	WQB 630	Baltimore Gas and Electric	Baltimore, MD
156.600	WQB 630	Baltimore Gas and Electric	Baltimore, MD
156.450	WQB 891	Baltimore Launch Service	Baltimore, MD
156.450	KGC 339	Bethlehem Steel	Baltimore, MD
156.600	KVY 616	City of Baltimore	Baltimore, MD
156.500	KZE 942	Great Lakes Dredge & Dock	Baltimore, MD
156.500	BTD 482	ITT Telecommunications	Baltimore, MD
156.450	WHG 687	L&L Marine Services	Baltimore, MD
156.900	KBB 916	Maryland Shipbuilding	Baltimore, MD
156.900	KGA 563	Maryland Shipbuilding	Baltimore, MD
156.450	WQZ 242	Maryland Tours	Baltimore, MD
156.900	KVL 869	Somat Marine Inc.	Baltimore, MD
156.550	WQB 495	State of Maryland	Baltimore, MD
156.850	WQB 495	State of Maryland	Baltimore, MD

The various bridges spanning the tributary rivers to Chesapeake Bay will provide some interesting listening from time to time. Among those which are radio equipped are the following:

156.425	KZA 872	Seyern River Bridge	Annapolis, MD
156.650	KZA 872	Seyern River Bridge	Annapolis, MD
156.425	KZA 871	Spa Creek Bridge	Annapolis, MD
156.650	KZA 871	Spa Creek Bridge	Annapolis, MD
156.425	KZA 873	Cambridge Creek Bridge	Cambridge, MD
156.650	KZA 873	Cambridge Creek Bridge	Cambridge, MD
156.325	KYQ 894	Choptank River Bridge	Cambridge, MD
156.650	KYQ 894	Choptank River Bridge	Cambridge, MD
156.425	KZA 871	South River Bridge	Edgewater, MD

156.650	KZA 871	South River Bridge	Edgewater, MD
156.425	KXE 254	Kent Island Narrows Bridge	Georgetown, MD
156.650	KXE 254	Kent Island Narrows Bridge	Georgetown, MD
156.425	KZA 868	Knapps Narrows Bridge	Georgetown, MD
156.650	KZA 868	Knapps Narrows Bridge	Georgetown, MD
156.425	KYU 699	Sassafras River Bridge	Georgetown, MD
156.650	KYU 699	Sassafras River Bridge	Georgetown, MD
156.425	KYU 695	Fishing Creek Bridge	Honga, MD
156.650	KYU 695	Fishing Creek Bridge	Honga, MD
156.650	KQ7 166	James River Bridge	Hopewell, VA
156.650	KQ7 169	James River Bridge	Newport News, VA
156.650	KA5 667	Stony Creek Bridge	Riviera Beach, MD
156.425	KZA 869	Main Street Bridge	Salisbury, MD
156.650	KZA 869	Main Street Bridge	Salisbury, MD
156.425	KYU 697	Wicomico River Bridge	Salisbury, MD
156.650	KYU 697	Wicomico River Bridge	Salisbury, MD
156.425	KYQ 896	Nanticoke River Bridge	Sharptown, MD
156.650	KYQ 896	Nanticoke River Bridge	Vienna, MD
156.425	KYQ 895	Nanticoke River Bridge	Vienna, MD
156.650	KQ7 166	Pammunkey River Bridge	West Point, VA
156.650	KQ7 166	York River Bridge	Yorktown, VA

Around Chesapeake Bay, the following stations can be found offering marine telephone service.

161.850	KGD 518	C & P Telephone	Bodkin Point, MD
161.900	KGD 518	C & P Telephone	Bodkin Point, MD
162.000	KRS 907	C & P Telephone	Cambridge, MD
161.825	KIC 631	C & P Telephone	Hampton, VA
161.850	KIC 631	C & P Telephone	Hampton, VA
161.900	KIC 631	C & P Telephone	Hampton, VA
161.950	KIC 631	C & P Telephone	Hampton, VA
161.875	WHU 746	Niagara Communications	Norfolk, VA
161.950	KSK 209	C & P Telephone	Prince Frederick, MD
161.900	KAQ 383	C Y P Telephone	Ridge, MD
161.900	KSK 223	C & P Telephone	West Ocean City, MD

The U.S. Coast Guard stations listed below often become active, particularly when the weather turns foul. The usual frequencies for USCG communications, including 157.100 MHz, should be tried.

Annapolis, MD	Little Creek, VA
Baltimore, MD	Ocean City, MD
Cape Charles City, VA	Parramore Beach, VA
Chincoteague, VA	Portsmouth, VA
Crisfield, MD	Roosevelt Inlet, DE
Dahlgreen Station, MD	St. Inignes, MD
Hudgins, VA	Still Pond, MD
Indian River Inlet, VA	Taylors Island, MD

Finally, while the National Weather Service stations do not provide traffic directly of interest, they can offer an indication of propagation, and also their weather forecasts can suggest times when other frequencies might be worth checking—such as when storms are approaching.

162.400	WX 2	Baltimore, MD	162.550	WX 1	Norfolk, VA
162.475	WX 3	Hagerstown, MD	162.475	WX 3	Richmond, VA
162.400	WX 2	Heathsville, MD	162.475	WX 3	Roanoke, VA
162.400	WX 2	Lynchburg, VA	162.475	WX 3	Salisbury, MD

In addition to the VHF frequencies mentioned above, particularly because of the Norfolk naval base, there will also be activity on the medium and high frequency ranges. From Portsmouth, Virginia, NMN will likely be found on any of the following frequencies: 466, 500, 8465, 12718.5 and 16976 kHz in CW, or 4428.7, 6506.4, 8765.4 and 13113.2 kHz in USB.

From Baltimore, Maryland, WMH is likely to be found on 428, 500, 4346, 6333.5, 6351.5, 8610, 8686, 12952.5, 12952.9 and 17093.0.

As always, 2182, 2670, 3130 and other HF telephony frequencies should provide additional activity of interest.

Your comments and suggestions are always welcome, and they should be sent directly to the address at the masthead.

USAF Wants "Sentient" Receiver

The United States Air Force has released a design requirement (AF87-049) asking for a "sentient" radio receiver using existing and new artificial intelligence technologies.

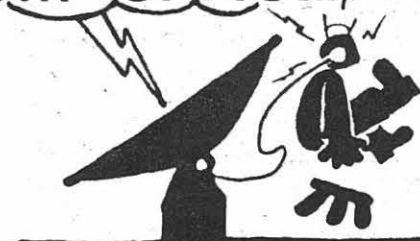
Air Force officials go on to define the device as "one that applies advanced information theory and artificial intelligence to the detection and demodulation of received communications signals." Such a

receiver could accumulate and store interference and distortion information, deleting those components from the desired signal.

Additionally, the sentient receiver could anticipate the desired components in a jammed or propagation-distorted signal, using "expert judgement" to correct errors in the demodulated data.

SIGNALS FROM SPACE

Larry Van Horn
160 Lester Drive
Orange Park, FL 32073



VOYAGER

Voyager pilots Richard G. Rutan and Jeana Yeager earned a place in aviation's record book with the completion of their nine day, nonstop, unrefueled flight around the world. Radio hobbyists from around the world had a back seat ride with the crew through their shortwave and satellite receivers.

The Voyager crew was able to maintain communications with their Mojave command center through NASA and Department of Defense communications systems. Flight officials have said that the flight would not have been possible without this help.

Two basic links were used by the crew for contact with mission control:

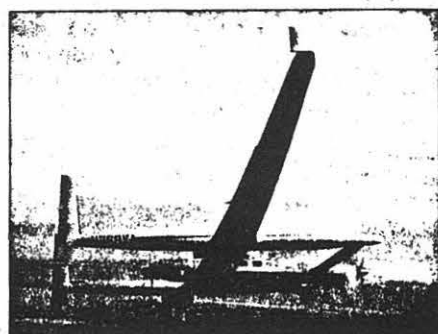
- * Direct UHF satellite link through the Navy's Fleet-satcom system;
- * HF communications with local ground stations with a variety of routings to mission control.

The State Department determined that the mission was in the national interest and made a recommendation to Donald C. Latham, Assistant Secretary of Defense for Command, Control, Communications and Intelligence, that the mission be allowed to use Fleetsatcom circuits. Latham sent a letter to the Joint Chiefs of Staff endorsing this position who, in turn, told the services to help the mission as long as it did not interfere with government traffic.

Mission Control was able to enter the Fleetsatcom network directly with a Motorola LST-5 lightweight transceiver and antenna pointed at either the 172°W or 100°W birds. Communications links were also established and patched back to mission control from the 23°W Fleet. It is unknown if the Indian Ocean bird saw any action.

Voyager also had an LST-5 aboard with a 1.5-ft. diameter, folding, hand-held antenna. Satellite operations required two people--one to talk and the other to point the antenna at the satellite.

Due to Rutan's size, he and the deployed antenna could not fit in the cabin area simultaneously, so UHF satellite comms were only conducted when Rutan was flying and Yeager was pointing the antenna. The only



other restriction on satellite comms was that the satellite had to be 30° above the horizon to prevent blocking the antenna's line of sight with Rutan's body or the engines.

Mission control entered the HF network via telephone lines to Vandenberg AFB, California, which was then connected to military and NASA communication systems. A variety of methods were used to connect Vandenberg to HF ground stations best suited to talk to the Voyager; these included telephone and satellite relays.

The Voyager carried a King KHF 990 high-frequency radio, a 150 watt unit normally used on helicopters. The unit weighs 22.5 lb, is solid-state and is capable of operating upper/lower sideband and AM. It was pre-programmed with all 176 international maritime radiotelephone network channels permanently stored in non-volatile memory, enabling the flight crew to select an appropriate channel and operate telephone patches through high seas operators. So far, I have not seen any reports that marine band comms actually took place.

The crew did note during the mission that radio transmissions did interfere with the King KAP 150 autopilot, causing the aircraft to toss about.

According to mission officials, neither UHF nor HF communications was always reliable for several reasons. HF comms suffered from an uncooperative ionosphere and the UHF wideband satellite channels used by Voyager were shared by 21 other users and communications could drop out when power output was divided among too many users.

SFS Tunes In

Most of the information I monitored consisted of weather and routing as well as checks on the condition of the

crew. I heard several interviews being conducted with the crew by members of the media. Most of these comms occurred by HF.

Satellite comms basically consisted of communication checks with stations of the Voyager net. Stations heard on the satellite nets included: Voyager 1, Voyager Mission Control, Voyager Test (Motorola in Arizona), NAVSCAMLAN, Offutt (AFB), MCC, Orange Juice, Brandywine, and Vandenberg.

HF stations monitored included: Capcom, Cape Radio, Voyager Mission Control, Abnormal 10, Abnormal 20, and of course Voyager 1. I am sure there were more, but one does have to sleep, eat and go to work!

The following is a list of the frequencies that have been confirmed by your editor as in use during the Voyager mission, followed by some unconfirmed frequencies.

Confirmed Voyager Frequencies

HF (kHz)	
3004	Secondary (not used)
5469	Secondary (not used)
6550	Primary, Ch 3 (night)
8822	Primary, Ch 4 (day)
10045	Secondary (not used)
13312	Primary (day)
20740	Secondary (not used)

Satellite (MHz)

261.475	Atlantic 23 west bird
262.150	Pac east 100 west bird
262.550	Pac east 100 west bird

Unconfirmed Frequencies

11407	MARS frequency
17487	MARS frequency
248.9	Marisat downlink
261.575	Fleet Bravo/Yankee
262.500	Fleet Charlie/Zulu
268.450	Fleet Charlie Navy relay channel
295.500	Uplink ??

Listeners that had the chance to monitor the Voyager flight all agree that monitoring history in the making was truly exciting. I would like to thank John Biro, Jerry Beneteau, Bob Grove, and the many other folks who wish to remain unnamed for the preparation of this article.

Military Aircraft

It is quite obvious that many of our MT readers are interested in military aircraft communications. Since this is the case, I plan on adding more coverage in this area. Starting next month, I will feature different military bases and their communications systems for military aircraft. Some of the frequencies in these profiles will have usages tagged on them; others will not but, by

Albuquerque ARTCC

Key:

L-Low Altitude
H-High Altitude

U-Ultra High Altitude (33,000-60,000)
D-Discrete

363.2	Ultra hi alt freq, Flight level 33,000-60,000
Alamogordo	DH132.65, DL132.65, H397.9, L397.9
Amarillo(Site #1)	DL127.85, L135.425, L261.5, DL351.7
Amarillo(Site #2)	H134.75, H381.6
Animas	D127.95, H133.0, H281.5, DL351.8
Carlsbad	DL132.55, DL343.6
Childs Peak	DL125.25, H126.45, L126.45, U132.45, H135.15, L288.3, DL307.3, H350.2
Clines Corner	DL132.8, H133.65, DL269.4, H284.6
El Paso (Site A)	DL132.55, H134.45, H278.3, DL343.6
El Paso (Site B)	L126.0, H133.275, H270.3, L285.5
Fort Stockton	DL132.55, H134.45, H278.3, DL343.6
Globe (Site #1)	DL124.5, H135.725, H258.3, L258.3, DL306.2, L338.3, H339.8
Globe (Site #2)	DL125.4, H132.35, L132.35, L133.85, H135.15, L260.0, DL269.3, L290.3, H350.2, H353.9, L353.9
Humboldt Mtn	H267.9, L267.9
Mesa Rica	U135.05, U363.2
Mount Dora	DL127.85, H133.05, H319.9, DL351.7
Nambe	DL134.5, DL353.8
Prescott	DL128.45, H132.9, L236.8, DL298.9, H312.0, H322.5, U135.325, U370.9
Raton	DL134.5, DL353.8
Roswell	DH132.65, DL132.65, H133.8, L133.8, H259.2, L259.0, H353.6, L353.6, DH397.9, DL397.9
Sandia Mtn	DL132.8, DL269.4
Silver City	H243.0, L243.0
Truth or Conseques	DL126.4, DH338.2
Tucson	DL127.95, H133.0, H273.6, L273.6, H281.5, DL351.8, L398.9
Tucumcari	DL125.6, H133.55, H135.7, H251.1, L267.9, H279.0, DL319.2
West Mesa	DL125.2, H133.65, H284.6, DL307.2, U135.05, U363.0
Winslow	DL126.9, H132.9, DL298.9, DL128.45, H312.0
Zuni	DL125.2, U134.6, U287.9, H135.8, DL307.2, H343.0

(SIGNALS FROM SPACE, cont'd)

presenting these allocations, MT readers should be able to find new active frequencies.

Starting this month I will feature one of the 22 FAA Air Route Traffic Control Centers. Known as the ARTCC, air traffic control specialists at these centers share primary responsibility for the control of aircraft that are flying on instrument flight plans.

When a military (or civilian) aircraft that is operating IFR (instrument flight rules) departs the area controlled by a tower, the departure controller in the tower relays control of that aircraft to the ARTCC. Through remote sites THE ARTCC communicates and controls the flight on his radar scope.

Each ARTCC is divided into

sectors geographically and vertically (low altitude, high altitude, ultra high altitude). Most airline and cross country military aircraft are controlled by these ARTCCs. The list I will provide each issue will give the VHF/UHF frequencies, geographic and altitude sectors and any discrete frequencies that might be in use.

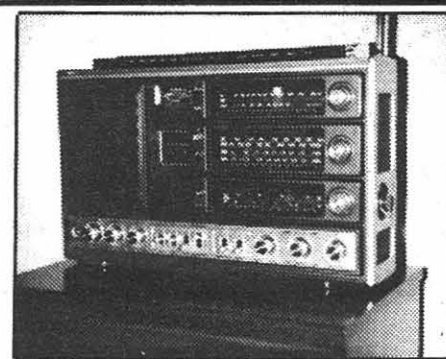
One excellent source of ARTCC facilities for the aircraft monitoring enthusiast is the sector chart. The information is free for the asking and portrays the ARTCC airspace and sector boundaries, as well as lists the VHF/UHF communications frequencies along with remote sites for that center's airspace.

The charts are revised several times each year, so the material will always be the most accurate. When

writing, just state that you would like copies of the high and low altitude sector charts for that specific ARTCC.

Our first ARTCC this month is the Albuquerque Center (see previous page). Their address for sector charts is: Albuquerque ARTCC, 6900 Los Angeles Drive NE, Albuquerque, NM 87113.

And that does it for this month. Remember to send in your mil aircraft and satellite information to the address listed in the masthead. Next month I will profile the Atlanta ARTCC, one of the busiest in the country. Also listeners on the east coast should be watching 143.625 as the Soviets should now be active from MIR when this goes to print. Until next month...



Above: Luxury portable multi-band radios are still available, as attested to by this Grundig Satellit 3000, the proud possession of H.E. Brown, Mt. Pleasant, Iowa.

Below: Richard Krepps of Houston, Texas, says, "Been a licensed ham for over 30 years, holding calls at one time or another of W1ACG (first; New Hampshire), WA2DIY (New Jersey), KX6DN (Kwajaleen, Marshall Islands), K4AMX (North Carolina), and finally retired in Houston, retaining original call, W1ACG."

Equipment: Icom IC-751 and IC-AT100 antenna tuner, IC-271A, IC-R71A, IC-R7000, Regency MX-7000, MX-3000, HX-1000, C-64, 1525 printer, AEA CP-100 RTTY demod, Emerson 4.5" B&W TV monitor (as RTTY display, etc), Icom IC-02AT (not shown).

Antennas: 300' longwire; 2 meter Hustler mobile whip TLM-144, 5/8λ active antenna (25-1000 MHz).

Holes in the Spectrum

Recently, MT columnist Larry Van Horn discovered quite a number of deleted frequencies from the official list of federal frequency assignments. Could these be classified? Are they active?

Nearly all air-to-ground frequencies in the 225-400 MHz military aircraft band are assigned in 100 kilohertz increments; the following frequencies are conspicuously absent:

225.2	247.8	324.6	369.4	387.3
225.9	248.7	325.3	369.6	387.6
226.1	252.6	325.6	370.6	387.7
227.9	254.1	328.6	370.8	388.3
228.1	255.5	328.7	371.3	388.6
230.3	256.1	328.8	371.6	388.7
230.6	256.3	328.9	372.4	389.3
230.7	259.5	329-	372.6	389.6
232.6	273.9	335.5*	373.2	389.7
235.2	274.1	337.3	374.1	390.4
235.6	274.9	342.0	374.2	391.3
235.7	275.3	343.5	374.3	391.4
236.9	279.1	345.7	374.5	391.6
237.1	282.4	346.1	374.6	392.3
239.6	282.9	347.0	374.7	392.4
242.8	285.3	349.2	375.4	392.6
242.9	293.3	354.5	375.9	392.7
243.1	293.9	355.7	376.4	393.2
243.4	298.2	357.3	377.3	393.6
244.6	302.9	357.7	377.4	393.7
245.4	306.5	358.5	377.7	393.9
245.6	208.3	360.5	377.9	395.2
245.9	313.6	364.3	378.4	395.3
246.1	314.1	364.7	378.7	397.3
246.4	316.0	365.6	379.6	398.3
246.6	316.6	366.4	382.3	398.4
246.9	319.5	367.8	386.1	398.7
247.1	322.2	368.2	386.7	399.1
247.3	323.6	369.3		

If you can identify or hear any activity on any of these, please notify Larry Van Horn, 160 Lester Drive, Orange Park, FL 32073.

If readers would be interested in similar lists for other parts of the spectrum, let us know at our Brasstown address.

* (Sats possible here)

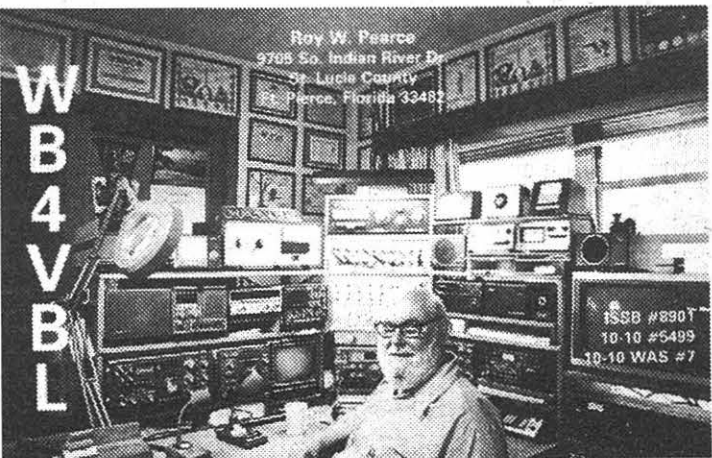
MT

MONITORING POST

Proud of your monitoring post or ham shack? Then this is your column--Send your photo and a brief description to Monitoring Post c/o Bob Grove or Larry Miller and see yourself in print!



Herb Shatz of Forest Hills, New York, sent his holiday greetings along with a nice shot of himself and his listening post: a Collins R390A, Drake TR4, Yaesu FRG7, Lafayette PF300, Bearcat 101, Grove TUN3 MiniTuner, and all operating from a shortwave dipole and VHF/UHF ground plane



QSL card from Roy Pearce of Ft. Pierce, Florida, showing his well-equipped ham shack.



Claudio Gnocchi-Franco of Walkersville, Maryland, has become an avid collector of old receivers. He now has Hallicrafters S20R, S38D, SX110; Lafayette HE30 and KT340; National NC125; and a Drake SPR4.

Claudio gets excellent signal strengths with a very unconventional antenna. Because of restrictive covenants his landlord won't permit outside antennas, so he runs his lead-in to a rain gutter!



ON THE HAM BANDS

Mike Mitchell, Jr, W7WHT
P.O. Box 20279
Seattle, WA 98102-1279

THE HISTORY CONTINUES - Developments in the 1920s

Last month we saw spark fade out and CW replace it during the early 1920s. But that was not the only major technical change during that period.

For example, while we like to think of our great technical progress today, the principles of the super-heterodyne, single sideband and voice modulation were all known prior to the 1920s--and to some extent were in use during that period.

What they couldn't do was take advantage of them the way we do today. This was because of the poor quality, limited availability and design of tubes. But as the 20's progressed, so did the tubes, receiver tuning circuits and transmitter output power.

The Art of Home Brew

There was no commercial equipment then as we know it now.

The hams in those days greeted each new available part (like the four prong bayonet base tube and socket) in the same way we greet the newest super-deluxe transceiver. They made most of their own parts.

Even with all those designs that were well known, only triode tubes were available and no one had yet figured out neutralization.

Separate oscillator-amplifier transmitters were also among the yet-to-be-invented. And antennas were not just something you connected to, they were an important part of the final tank circuit.

Lots of Batteries

Tubes needed filament power and this was usually accomplished with a six-volt storage battery. The plate supply was a bunch of dry cells connected (soldered) together to produce enough voltage.

The battery for the filaments was called the "A" battery and the plate supply the "B" battery. One holdover that has remained in use to

this day is the symbol most diagrams show as the power connection to the plate circuit "B+".

Transmitters--for those who could afford them--utilized motor generators (dynamotors) for high voltages. Another breakthrough occurred when "slop-jar" electrolytic rectifiers were shown to provide good DC. They comprised lead and aluminum strips in a jar filled with an ammonia or borax solution. Messy, but they worked!

As we mentioned last month, by the end of 1921 Reinartz had developed a good CW tuner and RCA and GE were starting to make transmitting tubes in quantity that worked reasonably well. And the need for expensive motor generators was quickly eliminated by that great invention we still use today--the high voltage rectifier tube.

Real widespread use of CW was suddenly possible at a reasonable price and spark was finished. Manufacturers were quick to start production of better parts and the number of manufacturers making equipment and parts simply exploded!

The flurry of commerce was actually the result of the broadcast

boom rather than the growth of amateur radio. Commercial radio was also clamoring for operators and equipment. Of course the broadcast business was voice and, while some amateurs experimented with or used voice ("phone"), CW was still the normal method of communications among amateurs.

The technical improvements made between 1921 and 1924 could fill several pages of *MT*, but suffice it to say that it was probably the greatest period of technical growth in the history of radio--before or since.

Multiple-tube equipment was designed; parts became uniform; and some of the high power transmitting rigs being built by 1925, while still antiques by today's standards, resembled the typical RF power amplifiers home-brewed by hams during the 50's and 60's.

Receiver design really got a lot of attention, again mostly due to the broadcast boom. Few manufacturers made parts and equipment especially for amateurs, but amateurs benefited from the improved variety quality and price of parts.

Hams were now set for the biggest discovery of all--our topic for next month--shortwave in the 1920's

CONVENTION CALENDAR

Date	Location	Club/Contact Person
Mar 1	Winchester, IN	Randolph ARA, Herb James RR2 Box 90, Ridgeville, IN 47380
Mar 7	Cave City, KY	Mammoth Cave ARC/ Joe Taylor, N4NAS Box 858, Glasgow, KY 42141
Mar 7	Ft. Myers, FL	Ft. Myers ARC/ Harry Arnold, K9ALX 5414 Brandy Circle, Ft. Myers, FL 33907
Mar 8	Rostraver, PA	Two Rivers ARC/ Mike Kowalcheck Box 184, Zimmer Rd, Greenock, PA 15047
Mar 13-15	Orlando, FL	Southeastern Division, John Lenkard, W4DNU 1046 Turner Rd., Winter Park, FL 32789
Mar 14-15	Lafayette, LA	Acadiana ARA/ June Bodensteiner 129 Patricia Anne, Lafayette, LA 70508
Mar 15	Sterling, IL	Sterling-Rock Falls ARS/ Susan Peters, KA9GNR 511 8th Ave., Sterling, IL 61081
Mar 20-21	Muskegon, MI	Michigan State/ Henry Riekels, WA8GVK 95 W. Webster, Muskegon, MI 49440
Mar 21-22	Mecklenburg, NC	Roanoke Division, Meck. ARS/ Gerald Hutchinson 2109 Princeton Ave., Charlotte, NC 28207
Mar 22	Toledo, OH	Toledo Mobile Radio Assn/ Brian Harrington 4463 Holly Hill Dr., Toledo, OH 43614
Mar 28-29	Kearney, NE	Nebraska State/ Timothy Loewenstein, WA0IVW Box 998, Kearney, NE 68848-1231
Mar 28-29	Elizabethtown, KY	Kentucky State Convention/ Jack Polk, WB4VFW 66 Tall Oak Ct., Elizabethtown, KY 42701
Mar 29	Grayslake, IL	Libertyville & Mundelein ARS/ Marc Abramson 1312 Millcreek Dr., Buffalo Grove, IL 60090
Apr 4-5	N.Little Rock	Central Ark. Radio Emergency Net/ Wayne Mahner 8 Canyon, N. Little Rock, AR 72116
Apr 5	Willingboro, NJ	Willingboro ARG/ Jose Alvarez, K2KMO 1343 Thornwood Dr., Mt. Laurel, NJ 08054
Apr 10-12	Kansas City, MO	Missouri State/ Chuck Miller, WA0KUH 7000 Northeast 120th St., Kansas City, MO 64166
Apr 24-26	Dayton, OH	Dayton Hamvention/ DARA Box 44, Dayton, OH 45041

MONITORING TIMES IS HAPPY TO RUN ANNOUNCEMENTS OF RADIO EVENTS OPEN TO OUR READERS. Send your announcement at least 60 days before the event to: Monitoring Times Convention Calendar, P.O. Box 98, Brasstown, NC 28902.

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And there's more! Monthly columns by: Joe Carr, K4IPV on the ins and outs of repairing and troubleshooting your radio; Bill Orr, W6SAI on antennas and antenna technology plus a lot more; noted HF/VHF operator and DX'er Joe Reisert, W1JR's world of VHF and UHF technology; Ernie Guerri, W6MGI on new trends in electronic technology; our own investigative reporter, Joe Schroeder, W9JUV with Presstop, your inside view to what's going on in the world of Amateur Radio; and noted government propagation expert Garth Stonehocker, K0RYW on propagation.

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RTTY - Let Your Fingers Do the Talking!

Last month we got you interested in the 160 meter band. Fresh from that success(?), we will now sally forth into the field of radioteletype.

I can remember pounding out messages on Teletype® Model 12's (they were so old, the carriage moved just like on a typewriter), Model 15's (the mainstay of the 40's and 50's) and Model 28's (the machine of the 60's and 70's).

I once even worked at a station which used (as late as 1972) a paper tape printer like you see in Western Union Stations in the old movies (remember the strips glued to the message form?). But today things have completely changed.

While there are still those who use old mechanical machines, in RTTY today, the computer is king. Add a monitor (or printer) and a converter and you've got RTTY. And it only costs about as much as we used to pay for the old Model 28's.

Since computers became popular and affordable during the last ten years, the ease and interest in getting into direct-printing RTTY (Baudot and AMTOR) has significantly increased while the cost went down. Packet and other digital modes are another story.

Just What is "Ritty"?

RTTY is a fun mode for both amateur and SWL; when the hams aren't hamming, they can listen with the SWLs to the utility stations and copy press and other neat stuff. Assuming you are already into the computer revolution, a simple converter will also put you into RTTY!

RTTY works by sending out a string of pulses which are sensed electronically in computers and magnetically in the mechanical printers. The sequence of pulses over a set time base indicates what symbol is being sent.

The code is binary--it's either a 0 (called "space" or lack of loop current or the higher frequency) or a 1 (a "mark" or present of loop current or the lower frequency).

There are several standard speeds and shift frequencies (or loop currents) used in RTTY. The common speeds are 60, 67, 75, and 100 words per minute.

You may hear the term "Baud" used in regard to RTTY; it is simply a measure of how many discrete signalling events occur in one second. 100 words per minute equals a signalling rate of 74.2 Baud. So "words per minute" and "Baud" both describe the transmission speed.

Shift frequencies and loop currents are the difference between the mark and space frequency/level. Current loops can range from 10 to

THE MT FAMILY OF WRITERS

Mike Mitchell, Jr.

Michael Mitchell, Jr., was born in Washington, D.C., on May 24, 1939. He attended school in Seattle, Washington, and was graduated from Seattle's Cleveland High School in 1957.

Mike joined the U.S. Naval Reserve while still in high school, becoming a member of a reserve submarine division. He completed submarine school with honors, but when he went on active duty, he was assigned to Joint Task Force Seven in support of the Atomic Energy Commission testing program at Eniwetok Proving Ground aboard the U.S.S. LCU 1384, a live-aboard landing craft (thereby becoming a

member of the Navy's "Radioactive Reserve")!

Upon completion of Operation Hardtack at Eniwetok, he was assigned to U.S.S. Thetis Bay CVHA-1 (later LPH-6) a jeep aircraft carrier, and after a cruise to the Orient he returned to civilian life, but remained in the Ready Reserve for several years. He served in Reserve Patrol Squadron VP-891 in Seattle. He was honorably discharged after ten years in the reserve holding the rate of Aviation Electronic Technician 2nd Class. From submarines to surface ships to aircraft in ten years!

As a civilian, Mike worked as

120 mA. The early standard was 60 mA and the current standard is 20 mA.

Frequency shifts can range from about 100 Hz to 1000 Hz. The early standard was 850 Hz, but the current standard is 170 Hz. Baudot is a five-level (five-pulse) code and ASCII is an eight-level (eight-pulse) code. ASCII can send a wider range of symbols than Baudot, but both are still in wide use.

In practice, transmission over radio uses frequency-shift keying (FSK, F1B emission) below 50 MHz and audio frequency shift keying (AFSK, A2B or F2B emission) above 50 MHz.

AMTOR (AMateur Teleprinting Over Radio) is a time-diversity method of reducing the error rate in RTTY by comparing two identical transmission segments for differences (errors) using Automatic Repeat Request (ARQ - called Mode A) or Forward Error Control (FEC - called Mode B), both of which use a single special processor/converter unit which operates automatically.

Amateur RTTY is generally heard just below the 'phone portions of the ham bands.

This column doesn't have the room to give you the full technical coverage that RTTY deserves, but there are several good books on the subject, and the ARRL Handbook has a very well-written article on RTTY suitable for both non-technical and technical readers. They also include a good bibliography on RTTY.

RTTY, especially when using a computer and a modern converter, is very easy to operate. You don't have to spend a lot of time learning all the technical ins and outs of it; with the simple equipment we've mentioned, you can be on the air as a ham or monitoring in a very short time.

Don't worry about your typing--just hunt and peck away like the rest of us and you'll do OK. You can also store outgoing (and incoming)

messages in memory and look like a real pro.

What will probably surprise you is how many people are on RTTY and all the neat stuff they are into and talk about. As easy as it is and with the reasonable prices for the converters, how can you not give it a try? Go for it--and let your fingers do the talking!

Bits and Pieces

I received a letter from Dick Hedlund of Honolulu who included a clip of a column from the December 3, 1986, *Honolulu Star-Bulletin* (HSB). It was a real surprise. Katashi Nose, KH6IJ, writes a weekly(?) ham column in a major daily newspaper! It's called "With Hawaii's Radio Amateurs."

It never occurred to me that a daily newspaper such as the HSB would publish such a column. What great publicity for hamming!

Gordon West, WB6NOA, of Radio School and writing fame, writes a very nice letter to point out that novice enhancement is upon us. He expects, and I certainly agree, that with its announcement (by the time you are reading this), the number of those wanting to become novices will increase considerably.

If all the expected changes are included, so will the activity on 10 meter voice and many 220/1240 repeaters. Three new voice privileges for novices! If all goes according to plan, we will have additional info on this in the April column.

Many of you SWLs who have been thinking of becoming hams will finally have enough incentive to overcome your inertia and get with it! A 5 WPM code test and a simple written test will get you lots of fun!

NEXT MONTH: Amateur Radio Clubs



an electronic technician and the technical writer/editor while attending college in Seattle. In 196 he returned to Eniwetok as contractor civilian and worked on the Navy's Pacific Missile Range as an electronic technician and later communications supervisor. After the range was changed to the Air Force Western Test Range he worked as a senior data analyst, operations manager, and finally a Eniwetok Site Manager.

He was transferred to Thule Greenland, in 1969 (out of the frying pan and into the freezer!) and worked in various operations positions, eventually becoming Quality Assurance Manager for RCA in Greenland and then, in 1975, Manager of Communications for ITT at Thule. He also served as Base Communications Engineer, Frequency Manager and CRYPTOC Security Officer during the period from 1972 to 1977.

In 1977 he returned to the U.S. and worked for a business consulting firm as a consultant. In 1979 he became President of Securintel, Ltd., a consulting firm in the area of physical and information security, intelligence and international affairs which he still operates.

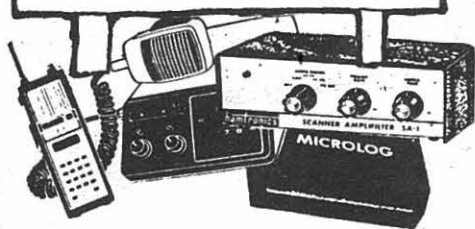
In 1985, he also started a company called First International Publishing Corporation which publishes directories, books and newsletters in several fields including communications, the fire service, law enforcement, and small business.

Mike became a ham in 1954 just after his 15th birthday and has been more or less active ever since. He is an Extra Class ham and also holds a General Radiotelephone Lifetime License (previously a First Phone) and is a Certified Electronics Technician by both NARTE (First Class) and NABER. Additionally, he is licensed as an Emergency Medical Technician, CPR Instructor and Red Cross Standard First Aid Instructor.

He is the Communications Officer for the local Red Cross chapter and is a VE for ARRL, W5YI and BEARS VECs. He leads a group of amateurs who give the monthly amateur radio exams in Seattle for ARRL VEC. He is a member of ARRL, RCMA, North Seattle Amateur Radio Club (of which he is Secretary) and is President of the Seattle Fire Buff Society. His hobbies are reading, writing, amateur radio, and fire buffing.

WHAT'S NEW?

Equipment Shelf



RUMBLINGS FROM SONY

The rumor mill has been active for quite a number of months now, asserting that a new, deluxe radio is due for imminent release from Sony. According to our sources, there are two pending products, neither of them earth shattering.

The ICF-SW55 (SW50 in Europe) will replace the popular 7600A portable, adding a digital display; expected retail will be \$269.95.

A model ICF-SW77 (SW70 in Europe) will be a follow-on of the AIR-8 which adds VHF coverage. No price was announced at this writing, nor a firm release date for either product.

REGENCY'S "INFORMANT"

Two innovative concepts are embodied in a new scanner from Regency Electronics. The "Informant" (INF-1) has a mammoth bank of pre-programmed police frequencies nationwide, selectable by state; scan (search) speed is a whopping 50 per second!

Designed exclusively for mobile use, the INF-1 comes equipped with a 12 volt cord for direct wiring into the vehicle's electrical system or plugging into the cigarette lighter, a multi-position mounting bracket and a telescoping whip antenna.

Regency's newly-patented "Turbo-Scan" technology also provides instant weather access to any National Weather Service broadcast.



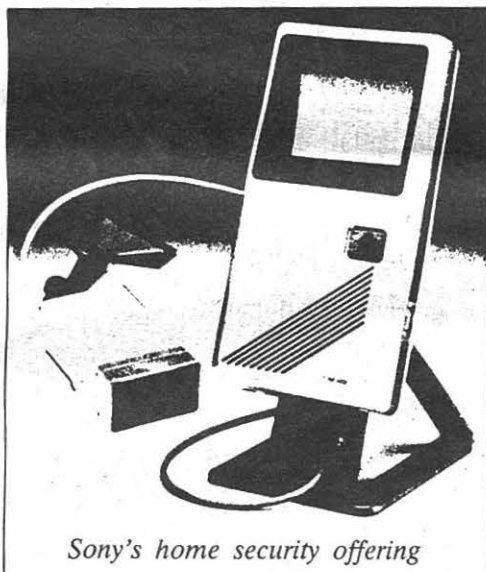
VIDEO MONOPOLIZES CES

January's Consumer Electronics Show in Las Vegas held no real surprises. Home video made a repeat performance as the leading consumer interest with miniaturization a key theme.

Pictured below is Sony's recent entry: a home security system utilizing the 4" flat screen CRT developed for their "Watchman" (TM) series of personal portable television receivers.

The ultra-compact surveillance system includes a sensitive microphone for audio pickup and is provided with a fisheye lens for wide angle viewing through a conventional door peephole.

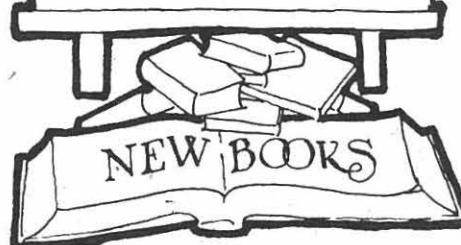
Extension cables are available to permit monitoring of subjects up to 200 feet away; a 67 foot cable is provided to interconnect the remote camera/mike with the monitor/speaker.



Sony's home security offering

Extremely simple to install and operate, the INF-1 Informant carries a suggested list price of \$369.95 and is targeted to truckers, sales personnel and others who spend long periods on interstate driving.

LIBRARY SHELF



CB'ers:

There is a magazine for you

We frequently receive comments from readers that there are no more magazines for the CB hobby. True, *S9* and *CB Magazine* folded a few years back, but one tabloid persists.

CB Voice, published by Dwight Allen (RR 2, Oregon, IL 61061), is a viable monthly which features jamborees, club news and hobbyist profiles. The February issue had an excellent biography of Al Gross, the father of CB radio.

Sample copies are only \$1 and a one-year subscription is \$12. Mention that you read about it in *MT*!

RADIO ASTRONOMY HANDBOOK by R. M. Sickels (256 pages, 7" x 8-1/2", spiral bound, from R.M. Sickels, 7605 Deland Avenue, Dept MT, Ft. Pierce, Florida 33451)

Interested in radio astronomy? Recent articles on the subject in *MT* have piqued interest among a number of readers, and Bob Sickels' newest handbook provides excellent insights.

Author Sickels is the editor and publisher of *Radio Astronomy*, the journal of the Society of Amateur Radio Astronomers. His insights and recommendations come from years of first-hand experience with the subject.

Written for the inquisitive home experimenter, chapters include considerable information on building your own antennas, receivers and recording equipment. A comprehensive list of radio sources is given along with a sky map showing prominent locations of radio objects.

The Handbook is filled with illustrations of equipment layouts, circuit diagrams, charts, and concludes with a chapter on useful formulas.

GOVERNMENT RADIO SYSTEMS (California) by Robert Kelty (256 pages, 8-1/2" x 11", paperbound; \$20 postpaid from Mobile Radio Resources, 2661 Carol Drive, Dept. MT, San Jose, CA 95125)

Robert Kelty has established himself as a leading authority on federal government scanner frequencies to be found in the state of California; state, county and local

listings are included in this latest (fourth) edition.

The book is organized by county and city (non-federal agencies) and by federal agency, sensitive law enforcement bureaus included.

Circuit details such as repeater input and output pairs, channel designators and tone codes are exhaustively reported. Since many of the federal agencies utilize nationwide channel allocations, the book is an excellent reference for all U.S. areas as well as California.

ICEBOUND IN THE SIBERIAN ARCTIC by Robert J. Gleason (165 pages, 5-1/2" x 8", paperbound; \$4.95 plus shipping from Alaska Northwest Publishing Company, Box 4-EEE Dept MT, Anchorage, Alaska 99509)

Bob Gleason, an *MT* subscriber and a lifelong professional radio operator, has chronicled the true adventure of the fur schooner *Nanuk* and an international search for arctic pilot Ben Eielson.

Profusely illustrated with newsphotos and clippings of the epoch, *Icebound* is a tale of incredible hardships and human persistence, with radio communications playing a vital role in survival.

Great reading on a cold winter's evening!

SHORTWAVE LISTENING WITH THE EXPERTS by Gerry Dexter (518 pages, 7-1/2" x 8-1/2", paperbound; \$22.95 plus \$2 shipping from Grove Enterprises, PO Box 98 Brasstown, NC 28902 and from some other *MT* advertisers)

Many of the names in this compendium of listening are familiar to shortwave and scanner listener alike--Gerry Dexter, Tom Harrington, Fred Osterman, Mike Chabal, Bruce Elving, Larry Magne, Dave Meisel, Terry Colgan, Darren Lenc, Harry Helms, Robert Horvitz, and more.

From teletype to tap recording, clubs to computers, space to pirates to police call broadcasting to utilities, **SHORTWAVE LISTENING WITH THE EXPERTS** is the most comprehensive and authoritative book ever written on listening, a veritable encyclopedia of radio monitoring.

Subjects include choosing antennas and receivers, the basics of how signals travel, coping with foreign languages, recording techniques, computerizing the monitoring post, the Russian (or American) "woodpecker", pirate and numbers stations, international broadcasting and medium wave, FDXing and subcarriers, radioteletype, shortwave utilities, introduction to scanner listening, QSLing, and station accessories.

The R-5000: Kenwood's Hot New Superset

Lawrence Magne, Editor-in-Chief
Radio Database International

I remember when I was a kid and sports cars were either too costly or had some problem or other. The Mercedes gull-wing model was just about ideal, but cost something like \$8000 -- big bucks in those days, and Ferraris were way up there, too. At the other end of the spectrum were the small British cars, such as the MG-TD, which were affordable and fun, but not really in the same league as their pricey counterparts from the Continent. Jaguar occupied something of a middle ground, but the things kept breaking down. Porsche, though, came through with models that were not ridiculously expensive, but which really performed well.

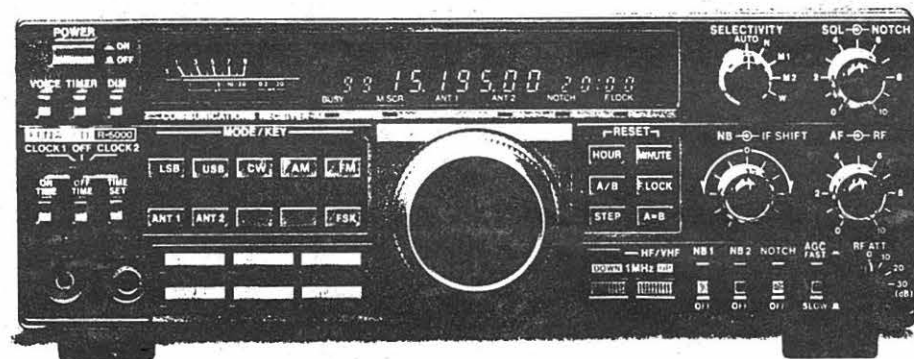
Costly But Not Ridiculous

I kept thinking back on those early Porsches as I was testing the new Kenwood R-5000 receiver,

which just came on the market. At \$899, it's costly, but not ridiculous. Yet, I can't think of anything currently available under \$1,000 that has hit the mark quite so well as this new receiver from Kenwood. Overall, it performs remarkably like the Japan Radio NRD-525, but for nearly \$400 less. And, as a bonus, its audio is better, too.

Features Aplenty

If you've seen the ads for the '5000, you already know that it has just about every feature imaginable except synchronous detection, and no other tunable tabletop model currently on the market comes equipped with synchronous detection, anyway. Among the '5000's features are some 100 programmable channel memories that store frequency, mode, and antenna;



The Kenwood R-5000 -- sensitive, selective, stable, good dynamic range, super audio -- a super set indeed!

keypad and knob tuning; a scanner of sorts; up to three voice bandwidths; passband tuning; a tunable notch filter; dual noise blankers; two clocks; and two VFO's. The synthesizer tunes in 10 Hertz segments, and the frequency actually displays to this degree of resolution. In all, there's really not much more you can ask for in the way of bells and whistles.

Worthy Ergonomics, But Small Front Panel

Like the pricey Japan Radio NRD-525, and unlike the ICOM IC-R71, the '5000's front panel is well laid out and easy to use, even if its controls are in the Japanese tradition of being too small. But here's the kicker. Unlike the Japan Radio and ICOM sets, the '5000 has surprisingly good audio, especially if you run it through a first-rate outboard speaker. At last, you can have a real DX machine that also works well for listening to shortwave programs.

Superb Overall Performance

Of course, if we're talking about the radio equivalent of a sports car, we do have to focus on performance under difficult conditions. Here, the unit we tested was a production model fresh off the shelf, not a prototype or special version. It performs on a par with sets costing hundreds -- even thousands -- of dollars more. Nearly all our twenty-odd lab measurements show results

ranging from good to superb. And most importantly, my ears confirm those findings. It's sensitive selective, stable, has reasonable dynamic range, and is remarkably free from the various types of "ghost" signals that are found on lesser sets.

Of course, nothing is perfect, and I don't want to compromise my years of notoriety as a grouchy nitpicker by suggesting that the '5000 is the be-all and end-all in shortwave receivers. As we already noted, the '5000 doesn't have synchronous detection, which is certainly a disappointment in a new set costing some \$900. But the standard '5000 has a couple of other shortcomings, too.

To begin with, the set comes equipped from the factory with only two voice bandwidths, which we measured at 6.3 and 2.5 kHz, respectively. The third voice bandwidth -- 1.9 kHz -- costs \$70 extra, plus installation. But the sticking point is that the standard 6.3 kHz bandwidth uses a really chintzy filter with mediocre skirt selectivity.

That's the bad news. The good news is that Kenwood offers a superior replacement filter of the same width that performs much, much better. This filter is easy to install -- you just take a screwdriver and remove the old filter and screw in the new one. But it does add another \$70 to the cost of the receiver. I can't imagine anybody buying this receiver to listen to shortwave broadcasts without replacing the standard 6 kHz filter, so what it comes down to is that the '5000 is actually a \$969 set, not a \$899 set as the price tag would lead you to believe. This makes it head-to-head competition with the ICOM IC-R71. But -- unlike the 'R71 -- the '5000's operating system is permanent. This means the set doesn't have to be sent back to a factory service facility for reprogramming should its battery die.

Aside from this, the only other real complaint is that the keypad's numerals are hard to read. Of course, receivers aren't like peas in a pod, and in any given respect the '5000 may be a bit better or a bit worse than the Japan Radio and ICOM sets. We've detailed all this in a new RDI White Paper on the '5000 (available by the time you read this)

(LIBRARY SHELF, cont'd)

UNO, DOS, CUATRO--A Guide to the Numbers Stations by "Havana Moon" (73 pages, 8-1/2" x 11", stapled offset printing; \$13.95 plus \$1.50 shipping from Grove Enterprises, PO Box 98, Brasstown, NC 28902 and some other MT advertisers)

Yes, he's back! Havana Moon, a former member of the intelligence community who attracted worldwide attention through his incisive investigative reporting of the notorious "spy numbers stations" in the pages of *Monitoring Times*, has compiled his wealth of knowledge into one information-packed document, loaded with facts and authoritative speculation about these tantalizing transmissions.

Looking back over the years, HM writes about the Nazi SS connection, who's who in the numbers game internationally, federal government replies to inquiries, crypto techniques, probable locations (many will surprise you!), and much more.

If you are a "spy numbers" buff, this is must reading. Facts never before revealed are contained within its pages as well as an up-to-date listing of frequencies and times of transmissions.

THE GUIDE TO CLONING AND CHIP MODIFICATION (27 pages, 8-1/2" x 11", paperbound with IBM diskette; \$40 from Resort Publishing Company, 100 Bridge St. #27, Dept. MT, Hot Springs, AR 71901)

As most of our readers are well aware, the issue of satellite TV descrambling is a hot one. Attendees of a recent conference on descrambling held by Bob Cooper and held offshore because of its controversial content found themselves subjects of a concerted U.S. Customs confiscation sweep upon their return to the states.

Surrendered by the returning voyagers were "clone chips", knock-off integrated circuits which are designed to plug into the popular M/A-Com Videocipher II commercial TV descrambler for HBO and similarly-encoded networks.

The book itself is controversial. While purporting to be "intended as an educational aid for those persons seeking technical information on the subject of microprocessor technology", it is clearly a how-to guide for the modification of existing descramblers for unlawful reception of pay TV.

Subjects include the tools of cloning along with a source guide of materials and proprietary information and techniques. The diskette contains eight files comparing the M/A-Com U30 programmable chip with several popular clones ("Three Musketeers", "Scamco", "Xact", "Master Clone", and "Clone").

The procedures alluded to in the publication are not simple weekend projects; much of the terminology will only make sense to readers with some digital sophistication. Additional costs will be incurred by those who follow the instructions and criminal penalties could also result.

Free Ham Repeater Maps

If you live in one of the following states, you may receive a free state map showing amateur repeater locations and frequencies for your state: NC, TN, KY, VA, AR, GA, OH, SC, WV, MD, and OR.

Send a self-addressed, stamped envelope with your request to David Jones, N4JED, 504 North Broad Street, Salem, VA 24153.

We are grateful to Dave for his supportive effort. How about sending an extra stamp to Dave for someone who may forget?

so that you can decide which set is most suitable to your own particular needs. But the bottom line is that the '5000 is in a league with only a handful of excellent sets.

Modifications Being Offered

A footnote to this is that Universal Shortwave in the U.S. tells me that they plan to offer the '5000 with two modifications. First, they will modify the frequency lock switch so that it acts as an AGC "off" control. Second, they will make available a 4 kHz filter to give the listener a fourth voice bandwidth option. I haven't been able to test these options yet, but if they work properly the '5000's performance should be breathtaking.

Another American firm, Electronic Equipment Bank, is also working up its own list of modifications, plus they will offer realignment to bring the set up to peak operating performance.

Whodunit?

I originated the *World Radio TV Handbook* equipment reviews in 1978 and did them until 1986. Unfortunately, this year it's not clear, because of the way the section is laid out, exactly who did the equipment reviews. I do want to make it clear that I had no part in preparing these. My annual reviews now appear exclusively in *Radio Database International*, so I'm afraid I can't be responsible for those conclusions reached in the 1987 *WRTH*.

Another point raised in letters and calls I've received concerns the lack of a *Radio Database International* advertisement -- or any other mention -- in the 1987 *WRTH*. In fact, an ad identical to that which appears each month in *Popular Communications* was to have appeared on page 176, but what actually materialized was a blank space, instead.

Radio Discovery Schedule Update

A clarification of the schedule for *Radio Discovery* in February: The station will be on the air daily except UTC Sunday and Monday from 0000 to 0400 UTC on 6215 kHz. On Saturdays, the station signs on at 1800 UTC and runs until 0000 UTC. (See program schedule, below). The station is not on the air at all on Sundays.

Meanwhile, White updates the station's Saturday program schedule: 1800 Caribbean music 1815 Crown of Life Ministries 1830 Voices of Our World. A new 28 minute program produced by the Maryknoll Missions, who work in 30+ countries around world. Basically a Third World radio magazine. Peoples,



Special \$239.99 (7.00 shipping)

50 Channels — Mobile/Base

Features include simple raised button keyboard programming of the following frequency ranges: 32-50 MHz, 118-136 MHz, 144-174 MHz, 421-512 MHz. Vacuum fluorescent display, dim control, priority, count transmissions, non-volatile memory retains memory without power back-up, automatic search, scan speed control, automatic search, scan delay, lockout, service search, automatic squelch, crystal-less, digital clock, external speaker & tape jack, auxiliary equipment control, plus much more. Built inside the rugged metal cabinet. Includes AC & DC cords, telescopic antenna, mobile mounting kit, and one year factory warranty on the Bearcat 300 for only \$239.99 and \$7.00 shipping. (Optional extended warranty: 3 years \$39.99, or 2 years \$29.99)

REGENCY HX1500

Digital programmable 55 channel hand-held scanner. Frequency coverage 29-54 MHz, 118-174 MHz, 406-420 MHz, 440-512 MHz. Covers Public Service bands plus aircraft, trains, marine, plus many others. Has priority, search, lockout, scan, banks, sealed rubber keyboard, 90 day factory warranty. Includes flexible rubber antenna, belt clip and earphone.

\$234.99 (plus 6.50 shipping each)

Optional Accessories:	
B-8 Ni-Cad Batteries	15.99
Ma-518 Wall Charger/Adapter	12.99
HXCase Heavy Leather Case	19.99
MA549 Drop-In Charger	89.99
MA257 Cigarette Lighter Adapter	16.99
(3 year extended warranty \$39.99; 2 year \$29.99)	

BEARCAT 50XL Programmable Hand-Held	\$124.99 (5.00)
AD100U AC Adapter/Charger for 50 XL	12.95 ()
BP50 Ni-Cad Battery Pack for 50XL	13.99 ()
CA50 Carry Case for 50XL	11.99 ()
PS001 Cigarette Lighter Adapter for 50XL 100XL	12.95 ()
BEARCAT 140 AC Programmable Scanner	94.99 (5.00)
BEARCAT 145XL AC Programmable Scanner	104.99 (5.00)
BEARCAT 175XL AC Digital Scanner	159.99 (5.00)
BEARCAT 100XL Digital Hand-held	199.99 (6.50)
BEARCAT 210XW AC DC Digital Scanner	189.99 (6.50)
BEARCAT 200 AC Digital Scanner	129.99 (6.50)
BEARCAT 155 AC Digital Scanner	124.99 (6.50)
BEARCAT Weather Alert	39.99 (4.00)
BEARCAT 20/20 AC/DC Digital Scanner	199.99 (7.00)
BEARCAT 300 AC/DC Digital Scanner	239.99 (7.00)
BEARCAT 800 XLT AC/DC Digital Scanner	319.99 (6.00)
REGENCY R1075 AC Digital Scanner	104.99 (5.00)
REGENCY MA-257 Cigarette cord for HX1000/1200	16.99 ()
REGENCY MA-917 Ni-cad Battery for HX1000/1200	24.99 ()
REGENCY HX-CASE Hwy Leath. case for HX1000/1200	19.99 ()
REGENCY MA-256 Drop in charger for HX1000/1200	89.99 (5.00)
REGENCY HX-2000 Digital Hand-Held	159.99 (7.00)
REGENCY MX-3000 AC/DC Digital Scanner	216.99 (6.50)
REGENCY HX-2200 Digital Hand-Held Scanner	172.99 (7.00)
REGENCY MX-5000 AC/DC Digital Scanner	329.99 (6.50)
REGENCY MX-4200 AC/DC Digital Scanner	186.99 (7.00)
REGENCY Z-30 AC/DC Digital Scanner	129.99 (5.50)
REGENCY Z-60 AC/DC Digital Scanner	189.99 (5.50)
Mobile Mounting Bracket for Z Scanners	5.99 ()
REGENCY ACT-R-1 AC/DC Crys. Single Channel	75.99 (4.00)
REGENCY RH-256 High Band Transceiver	119.99 (5.00)
REGENCY UC 102 Hi-VHF Hand Transceiver	124.99 (5.50)
REGENCY RU150B UHF Transceiver	439.99 (7.75)
REGENCY RH-600B High Band Transceiver	459.99 (7.75)
REGENCY R806 AC DC Crystal Scanner	79.99 (5.00)
COBRA SR12 Digital Hand-Held Scanner	199.99 (6.50)
COBRA SR10 Digital Hand-Held Scanner	129.99 (6.00)
COBRA SR900 AC DC Digital Scanner	109.99 (5.00)
COBRA SR925 AC DC Digital Scanner	164.99 (6.00)
Book "Top Secret Registry of Gov't Frequency"	29.99 (3.00)
Book "Covert Intelligence, Electronic Eavesdropping"	8.95 ()
Book "Betty Bearcat Frequency Directory"	14.95 ()
Book "Rail Scan Directory"	7.95 ()
Book "Air Scan Directory"	12.95 ()
RCD MRP-1 Single Channel Hand-Held	38.99 (3.00)
FANON M8HLU DC Crystal Scanner	99.99 (5.00)
FANON PSK-1 AC Adapted for M8HLU	12.99 ()
FOX BMP-1060 AC/DC Digital Scanner	129.99 (5.50)
FOX Mounting Bracket for BMP-1060	9.99 ()
ANT-1 Magnet Mount Mobile Scanner Antenna	29.99 (3.00)
ANT-6 Base Scanner Antenna w/50' cable	29.99 (3.00)
BEARCAT 70XLT Programmable Hand-Held	174.99 (5.50)

SCANNER WORLD, USA

10 New Scotland Ave., Albany, NY 12208 518/436-9606

Regency Z30 30 Channel Automatic Programmable Scanner

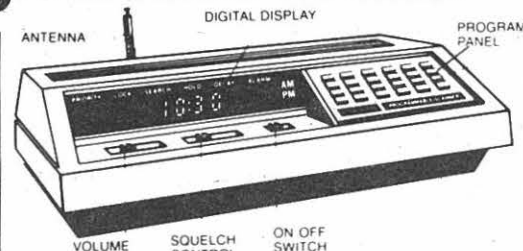
Scanner World Special

\$129.99

(plus \$5.50 shipping each)

Optional Accessories:

Cigarette Lighter Plug RGMPC \$4.95
Z Mobile Bracket — Special ... \$5.99



The Regency Z30 is a compact, programmable 30 channel, multi band, FM monitor receiver for use at home or on the road. It is double conversion, super heterodyne used to receive the narrow band FM communications in the amateur, public safety and business bands: 30-50, 144-174, and 440-512 MHz. Size 10 3/4" W x 2 7/8" H x 8 3/8" D.

Sophisticated microprocess-controlled circuitry eliminates the need for crystals, instead, the frequency for each channel is programmed through the numbered keyboard similar to the one used on a telephone. A "beep" acknowledges contact each time a key is touched. The Z30 scans approximately 15 channels per second.

Any combination of two to thirty channels can be scanned automatically, or the unit can be set on manual for continuous monitoring of any one channel. In addition, the search function locates unknown frequencies within a band.

Other features include scan delay, priority and a bright/dim switch to control the brightness of the 9-digit Vacuum-Fluorescent display. The Z30 can be operated on either 120 VAC or 12 VDC. Includes one year warranty from Regency Electronics (optional 3 yr extended warranty only \$39.99, gives you a total of 4 yrs complete warranty or 2 yr extended warranty only \$29.99, gives you a total of 3 yrs complete warranty.)

Regency HX2200

\$172.99
(Plus \$7.00 shipping each)

Digital Programmable 20 Channel Hand-Held Scanner with raised button keyboard for easy programming of the following frequency ranges: 118-136 MHz, 138-174 MHz, 406-512 MHz, 800-950 MHz (NOTE: This is the only hand-held portable scanner which will receive the 800-950 MHz range plus high band, air, and UHF). Features include priority, scan delay, memory backup, dual scan speed, channel lockout, jacks for external antenna and earphone, 90 day factory warranty, keyboard lockswitch, sidelit liquid crystal display for night use, program AM or FM mode, search or scan, size is 3" x 7" x 1 1/2". Complete HX2200 package includes Ni-Cad rechargeable batteries, wall charger adapter, protective carry case, and rubber antenna. All for the low price of only \$172.99 plus \$7.00 shipping each. (Optional extended warranty: 3 years \$39.99, or 2 years \$29.99)

Regency MX4200

\$186.99 (Plus \$7.00 shipping each)

Digital programmable 20 channel scanner operates as a Base or Mobile unit or can be used as a portable with rechargeable Ni-Cad batteries included. MX4200 covers the following frequency ranges: 30-50 MHz, 118-174 MHz, 406-512 MHz, 800-950 MHz. Features compact size of 5 1/2" x 2 1/4" x 7 1/2", memory backup, scan delay, priority, dual scan speed, channel lockout, jacks for earphone and external antenna, keyboard lockswitch, one year factory warranty. Sidelit liquid crystal display for night use, program AM or FM mode, search or scan, reset button. Complete MX4200 package includes telescopic antenna, mobile mounting bracket, mobile power cord, rechargeable Ni-Cad batteries, wall charger adapter. All for the low price of \$186.99 plus \$7.00 shipping each. (Optional extended warranty: 3 years \$39.99, 2 years \$29.99). Optional cigarette lighter Plug #4200MPC \$4.99.

Bearcat 100 XL

\$199.99 (6.50 shipping) Handheld digital programmable, no crystal portable scanner. 16 channels, search feature, plus more! Frequency range: 30-50, 118-174, 406-512 MHz. Included in the package is a flexible rubber antenna, earphone, battery charger/AC adapter, 6 AA Ni-Cad rechargeable batteries and a heavy duty carry case. All for the low price of:

\$199.99 (6.50 shipping)

(3 year extended warranty only \$39.99, 2 year \$29.99)

REGENCY RH-256

PROGRAMMABLE TRANSCEIVER

RH-256B Transceiver, 16 channel 12 VDC 2-way Radio fully programmable in transmit and receive mode. Includes built-in CTCSS tones for encode/decode, time-out timer, scan delay, 25 watts transmit power, priority, plus more. Frequency spread as shipped 152-158 MHz. Package includes mobile mike, bracket, mobile antenna, and all cables and instructions for installation. **Special package deal only: \$399.99** (7.75 shipping) (2 year extended warranty \$49.99 - 3 year \$69.99)

ORDERING INFORMATION

Call (518) 436-9606 to place orders by phone or mail orders to **Scanner World**, 10 New Scotland Ave., Albany, NY 12208. Orders will be shipped same day received by United Parcel Service. **Scanner World** accepts VISA, MasterCard (COD shipments by United Parcel will be for cash or certified checks only). Mail orders with personal or business checks will be held 4 weeks for bank clearance. Orders with cashiers checks or money orders shipped same day received. Prices, specifications and terms subject to change without prior notice. If items are out of stock we will backorder and notify you of delivery date. All shipments are F.O.B. **Scanner World** warehouse in Albany, NY. We are not responsible for typographical errors. All merchandise carries full manufacturers warranty. Bid Proposals and Purchase orders accepted from Government agencies. Free full line catalogue available upon request. No minimum order. New York State Residents add 7% sales tax.

SHIPPING CHARGES

(*) Add \$5 per scanner, and \$3.00* for all accessories ordered at same time. C.O.D. shipments will be charged an additional \$3.00 per package. Full insurance is included in shipping charges. All orders are shipped by United Parcel Service. Shipping charges are for continental USA only. Outside of continental USA, ask for shipping charge per scanner.

Scanner World, USA

10 New Scotland Ave., Albany, NY 12208

(518) 436-9606

Most orders Shipped Same Day Received!

voices, issues, events in El Salvador, Taiwan, Zimbabwe, Brazil, etc.

1900 Puntos de Vista. Spanish Version of Voices of Our World, but 15 minutes.

1915 Caribbean music.

1930 Gente en Jerusalem. A culture and current affairs magazine program from Israel Radio in Spanish.

2000 Europarada European top 40 in Spanish.

2100 Musica Joven. Program of Israeli popular music.

2130 U.S. Rock Top 5 hits in the USA with Bill Parris.

2200 Caribbean music.

2230 Rerun of Voices of Our World.

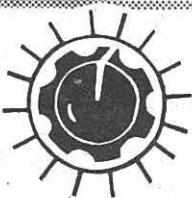
2300 Repeat of Puntos de Vista.

2315 Caribbean music till 0000

Both White and Radi Discovery's air personality Rud Espinal were recently honored by th Santo Domingo-based Mund Diexist (DX World) with the group International Communicator award. The award was in recognition of their "consistent support for worldwide communications, an above all, worldwide DXing."



BEHIND THE DIALS



The Radio Shack PRO-2004 Programmable Scanner

A review by Bob Parnass, AJ9S
Oswego, Illinois

Manufactured in Japan by General Research Electronics, the Radio Shack PRO-2004 is a 300 channel, wide coverage scanner radio, incorporating NBFM, WBFM, and AM modes.

Although the catalog description doesn't do the radio justice, the microprocessor circuitry provides features not found in other base/mobile scanners.

This review, although admittedly subjective, focuses on three broad characteristics: feature set, basic electrical performance, and mechanical construction.

Frequency Coverage

The PRO-2004 literature states that coverage is continuous from 25-520 and 760-1300 MHz. Radio Shack's last minute decision to remove cellular telephone frequency coverage from the PRO-2004 caused a 7 week delay in its introduction. A small card is now packed with each scanner, informing the buyer that the radio will not operate in the 825-845 and 870-890 MHz ranges.

A matrix of diodes, attached to the microprocessor's input port, is often used to configure radios for sale in different markets. From recent flux on the circuit board, it appears that a diode has been added or removed

from my PRO-2004, and this may be how the cellular telephone coverage was yanked (see inset below...Ed.).

Lots of Memory

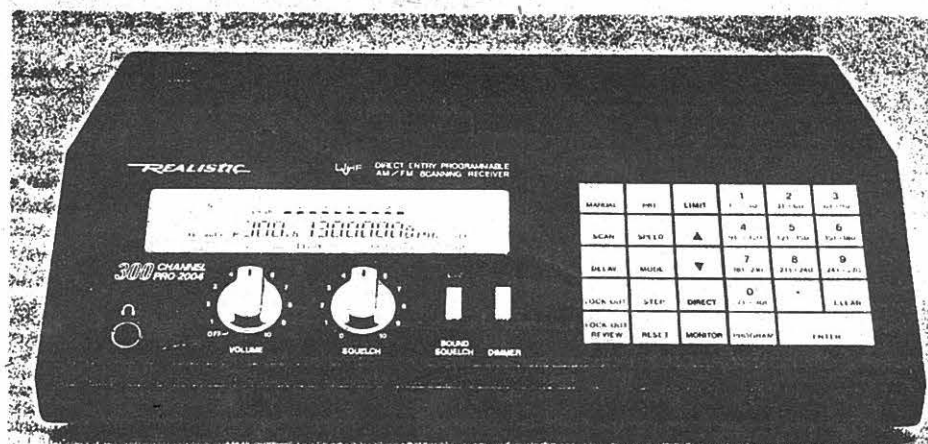
The PRO-2004 has the usual features that scanner buffs have come to expect: individual channel lockouts, selectable rescan delay, an external speaker jack, etc. But the 300 channel capacity of the PRO-2004 sets an industry record! Casual scanner users may scoff at the usefulness of having so many channels, but seasoned monitorists can have those channels filled up in no time flat, especially with frequencies in the vast 225-400 MHz military air band.

With so many channels to program, one dreads the thought of a power failure which could clear memory in a hurry. Not to worry, the PRO-2004 memory is backed up by a conventional 9 volt alkaline battery (not supplied). The 300 channels are divided into 10 banks of 30 channels each, and one can select or deselect any channel bank from the scan list. Individual channels can be locked out in the customary way, but the PRO-2004 provides a new feature, a LOCKOUT REVIEW. Successive depressions of this key step through the locked out channels.

Restoring Cellular Coverage on the PRO-2004

1. Remove the four cabinet screws and the cabinet
2. Turn receiver upside down and locate circuit board PC-3
3. Remove seven screwsholding board and plug CN-501
4. Carefully lift up the board and locate diode soldered in place below the module
5. Snip one lead of the diode carefully, leaving it suspended by the other lead for later reattachment if desired, such as for warranty repair
6. Reverse first four steps above for reassembly. Radio will now cover 825-845 and 870-890 MHz and search in 30 kilohertz increments for no-gap 760-1300 MHz reception.

(Thanks to Jim Marquand and other readers)



The owner's manual refers to the ability to *delete* a channel by storing a 0 frequency in it, not a particularly useful exercise. The scanner will still spend time scanning a "deleted" channel unless it is locked out with the LOCKOUT key, which then means it appears in the lockout list when using the LOCKOUT REVIEW feature.

Scanners worth their keep have a priority feature, with channel 1 usually designated the priority channel. The PRO-2004 is more flexible; any of the 300 channels may be designated the priority channel. When the PRIORITY key is depressed, that channel will be sampled every 2 seconds, and the radio will stay there if a signal is heard.

The PRO-2004 has two scan speeds, 8 and 16 channels/second, although one would probably use the faster speed in most instances. This compares favorably with 14 channels/second speed of the Bearcat 800XLT.

When programming a channel, the PRO-2004 firmware sets the mode automatically, based on its idea of what mode is most prevalent on that frequency. This feature saves extra keystrokes, and makes one appreciate the thought that went into the design of this radio. The default mode can be overridden easily, if need be, like to listen to a NBFM satellite in the 225-400 MHz range, which is mainly populated with AM signals.

Searching

The SEARCH facility found on most programmable scanners allows the entry of a pair of frequencies, then by pressing a key, the radio searches frequencies between those limits. The PRO-2004 allows for 10 pairs of limits! These pairs of limits are stored in their own memory, and don't use up any of the conventional 300 memory channels. One can set up several search pairs, for instance:

— 46.610-46.970 MHz: cordless telephones

— 144-148 MHz: the 2 meter ham band

— 30.01-30.56, 32-33, 36-37 MHz: US Govt

Another unique feature is the MONITOR key, which stops the search and stores the frequency in one of ten special monitor memories. These memories are separate from the 300 main memory channels. The search can be restarted from where it left off by striking the up or down arrow key.

The user can select the search direction (up or down), and step size of 5, 12.5, or 50 KHz, although the PRO-2004 is intelligent enough to select a default step size based on the frequencies being searched. The owner's manual claims that a step size of 30 KHz is also available, but apparently this step size was disabled when the cellular telephone frequency coverage was removed.

The selected parameters are displayed on the LCD panel. Search speed is switchable between slow and fast, with fast search being about 14 increments/second (versus 12 for the 800XLT). For a 12.5 KHz increment, this translates to 11.2 MHz/minute (versus 9.6 MHz/minute for the 800XLT).

The DIRECT key allows one to start searching up or down from whatever frequency is on the display. Let's say the scanner is in MANUAL mode, and set at channel 26, which contains 460.100 MHz. Striking the DIRECT then UP-ARROW keys starts the PRO-2004 searching upwards from 460.100. This is a nice feature.

The PRO-2004 contains a "window detector" circuit, which is called into play during a SEARCH operation. This circuit tries to detect when the radio is tuned close to the center frequency of a station, and prevents the search from halting prematurely, off to the side of the signal.

Another interesting feature is the SOUND SQUELCH, which may be used during scan or search operations. With the the sound squelch

TABLE 1. Sensitivity of Radio Shack PRO-2004 vs. ICOM R7000

Band	PRO-2004	R7000
47 MHz	slightly less sensitive	slightly more sensitive
72 MHz	more sensitive	less sensitive
Commercial Air Band	(not tested)	(not tested)
150-165 MHz	equal	equal
223 MHz	less sensitive	more sensitive
460 MHz	equal	equal
855 MHz	much more sensitive	much less sensitive
953 MHz	more sensitive	less sensitive

enabled, signified by a red lamp above the pushbutton, the scanner will skip over unmodulated signals. This is handy for skipping over "birdies", or link signals with a constant carrier.

The manual warns that the sound squelch may be fooled by signals with low modulation, and skip over them. The PRO-2004 SOUND SQUELCH tries to detect the presence or absence of modulation (not human speech), so unfortunately, it thinks that mobile phone idle tones, digital data signals, and paging tones are worth monitoring and will stop the scanner to listen to them.

Taping Facility

A tape recorder can be connected to the TAPE phono jack on the rear panel, which provides 600 mV of audio at a 10,000 ohm impedance. In addition to a rear mounted external speaker jack, there is a head-phone jack on the front of the scanner.

Basic Performance

To evaluate sensitivity, the \$400 PRO-2004 was compared with a \$950 ICOM R7000 and a \$300 UNIDEN/Bearcat 800XLT.

On 850 MHz, signals were readable on the PRO-2004 which couldn't even be detected on the R7000.

Although the 800XLT is the most sensitive radio of the three tested, it suffers from images and overload much more than the PRO-2004 or R7000. The PRO-2004 has a 10 dB attenuator, operable by a slide switch on the rear, but its use has been unnecessary thus far.

The up conversion design of both the ICOM and Radio Shack units allows use of a very high IF (intermediate frequency), which helps avoid image problems. The PRO-2004 owner's manual doesn't list the IF frequencies directly, but a good guess is that the first two IFs are 610 MHz, 70 MHz. The third IF looks something like 455 KHz when using AM or NBFM, and perhaps 10.7 MHz when the WBFM mode is selected.

TABLE 2. Sensitivity of Radio Shack PRO-2004 vs. Uniden/Bearcat 800 XLT

Band	PRO-2004	800XLT
47 MHz	equal	equal (many images)
72 MHz	N/A	N/A
Commercial Air Band	(not tested)	(not tested)
150-165 MHz	less sensitive	more sensitive
460 MHz	less sensitive	more sensitive
855 MHz	slightly less sensitive	slightly more sensitive

The PRO-2004 is slightly more selective on NBFM than the 800XLT. WBFM selectivity is rated at about twice as wide as the ICOM R7000.

The audio output quality is good, although it seems to lack the punch of the 800XLT audio.

Unfortunately, the audio level of AM signals is somewhat below that of NBFM signals, requiring a different setting of the volume control. When scanning both AM and NBFM modes, one has to find a compromise position of the volume control.

The PRO-2004 squelch control has a bit too much hysteresis, a trait inherited from its ancestors. It's like having too much play in a car's steering wheel, or backlash in a gear set. This hysteresis forces one to keep the squelch at a tighter setting, missing weaker signals when scanning or searching.

Mechanical Construction

The PRO-2004 is heavy. It is enclosed in a metal cabinet, but has a plastic front panel. If one is going to pay \$400, one deserves to own some metal. The entirely plastic cabinet of the older PRO2003 allowed wideband noise to radiate out of the scanner and into nearby shortwave receivers.

There is a single BNC antenna connector on the rear of the PRO-2004, and a single telescoping antenna is supplied. This differs from the 800XLT which has 2 "Motorola type" antenna connectors, one reserved for the 800 MHz band.

Internal construction is excellent. Most stages are completely enclosed in their own individual shielded boxes. Interstage shielding is very important in a wide band receiver, to prevent it from "hearing itself", an undesirable phenomenon which results in *birdies*.* The shielding is much better in the PRO-2004 than in the

* The PRO-2004 owner's manual lists 53 birdie frequencies, although 16 of these (or 30%) are above 900 MHz. The birdies at 29.635, 155.124, and 464.250 MHz are close to frequencies of interest and may interfere with reception.

800XLT, which uses no shielding around the 800 MHz converter stage, and probably accounts for some of the birdies in the Bearcat.

Frequencies and other indicators are displayed on a backlit LCD (liquid crystal display) panel, and the level of backlighting can be dimmed by a pushbutton switch.

The flat membrane keyboard has a nice feel. Only slight pressure is required for actuation, and key depressions are confirmed by a mild "beep" audio tone.

The PRO-2004 might be too large to fit under the dashboard of compact cars. Although it can be operated on 12 VDC, neither a mobile power cord nor mounting bracket are provided. These items were included with earlier Radio Shack models. The AC power cord is not detachable, and would have to be bundled up to keep it out of the way in a mobile installation.

Owner's Manual

The user manual suffers from Japanese to English translation problems, but is fairly good, resembling other Radio Shack scanner manuals.

What's Missing?

So with all these neat features, what's missing from the PRO-2004? A "search and store" mode, like that on the ICOM R7000 and older Bearcat 250 would have been nice. A lighted keyboard and a signal strength meter would also be welcome.

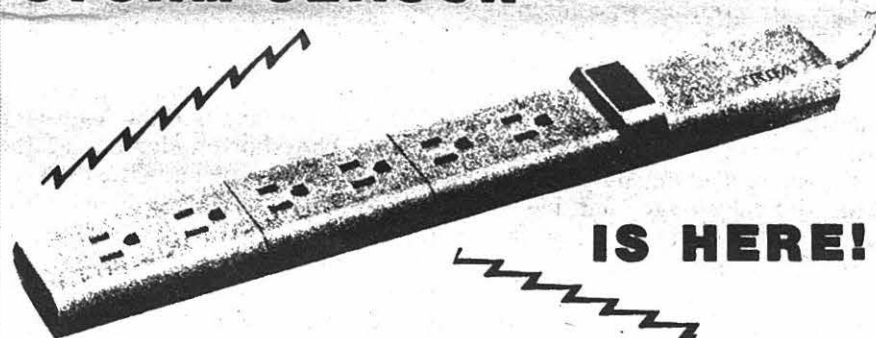
Summary

If all one wants is a scanner to monitor local police and fire, there are certainly cheaper and simpler models than the PRO-2004. This scanner is for those who enjoy *actively* exploring voice communications in the VHF/UHF spectrum.

The PRO-2004 has the right features and performance, especially for scanning the wide 225-400 MHz military aircraft band. Good design should not to be taken for granted. GRE engineers used the power of the microprocessor to implement useful features in the PRO-2004. Similar processing horsepower was not used so wisely in a recent Yaesu scanner.

At about \$400, the PRO-2004 provides a good alternative to those not wishing to spend \$950 for an ICOM R7000.

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Basic VHF/UHF Antenna Design

As you have probably noticed, antennas tend to be smaller at higher frequencies; for instance, a dipole at 7 MHz is usually cut to length at somewhere in the neighborhood of 67 feet, while a 144 MHz version of the same dipole is less than four feet long. That's quite a difference! And unless you already know the reason for this difference in length, you have probably wondered just why this is so.

In this month's column, the first of a two-part series, we will explore this question and also present some important factors which we must consider in understanding antennas used for the VHF and UHF bands. Next month we will deal with specific commercial and home-constructed antennas available for these bands.

Wavelength, Tuning and Such

The difference in antenna length has to do with the phenomenon called "wavelength" of a radio wave. I'll be discussing the meaning of wavelength at the end of this month's column as I answer last month's Radio Riddle; but, for the moment, let's just say that higher frequency radio waves have shorter wavelengths--a single "shortwave" radio wave occupies a shorter space than does a "longwave" radio wave.

Without trying to get too technical about it, let's just say that a shorter wavelength signal will naturally "fit electrically" to a shorter antenna element, and that a longer wavelength signal will "fit electrically" to a longer antenna element.

Resonance

There is a resonance, or tuning effect, which operates in most antenna designs just as surely as the tuning accomplished by the tuning dial of your receiver; so, cutting your antenna to the proper length for a specific frequency actually tunes your antenna to that frequency's wavelength.

When the antenna is the wrong length for a particular frequency, it is out of tune at that frequency, and therefore doesn't respond to signals of that frequency as well as if it were cut to the correct length. Yes, an antenna is a tuned circuit, and as a matter of fact, the antenna is the first tuned-circuit which an incoming signal encounters on its way to your

loudspeaker!

It follows from the above discussion that a well designed antenna can actually help you reject out-of-band signals--signals to which it is not tuned. This rejection effect is of some interest, but usually we are much more interested in optimizing the antenna's response to the signals to which it is tuned, those we want to monitor.

As we have discussed in this column in the past(1), antenna elements which are 1/2 or 1/4 of a wavelength long are particularly useful in creating resonant ("in-tune") antennas. Thus, the mystery of why we find antennas with shorter dimensions at higher frequencies becomes clear: the higher the frequency of a radio wave the shorter its length.

Some Other Design Factors

Element length is not the only factor of interest in antenna design. Another is choosing between a non-directional antenna and a directional ("beam") antenna like the Yagi-Uda (fig.1). The shorter element at the front end of the beam is the director element and the longer one at the rear is the reflector element. The combined effect produces a gain in signal strength over that to be had by use of the middle element alone.

But, how many of us readily recognize that the coaxial antenna of figure 2A is also a beam antenna in one sense? True, it is a non-directional antenna in the horizontal plane (fig.2B) but, in the vertical plane (fig. 2C), it beams its power close to the earth rather than wasting it in sky waves, which are of no use at

all in general utility terrestrial communications.

The point here is that we may choose antennas to beam signals in the horizontal plane like the Yagi-Uda or in the vertical plane like the coaxial antenna does. We can also design for directivity in both planes simultaneously.

Gain

Another important factor in antenna choice, especially at VHF-UHF wavelengths, is gain, an indication as to how much signal an antenna will deliver in comparison to other antennas used under identical circumstances.

It is common to rate antenna gain in decibels (dB); for instance, a three-element Yagi-Uda beam is said to have a gain of 10.1 dB; a halfwave dipole is only 2.1 dB; and gain for the common quarter-wave ground plane antenna comes in at a very low 0.3 dB.

But we all know that the dipole and the ground plane both support a lot of solid radio communication. The moral in this, of course, is that high gain is often not necessary for good reception.

If you are trying to receive relatively weak signals, gain is one of the most important factors to consider. If you deal only with strong signals, local signals, for instance, other factors such as antenna radiation pattern may be much more important. That is, if the signals which you monitor have a good signal strength to start with, it is more important to get an antenna that will give all-around, non-directional reception than it is to have a high gain antenna.

Perhaps you may want help in rejecting some unwanted signals coming from specific directions; in that case, the directional characteristics of a beam are more important than its gain.

Bandwidth

Antennas vary considerably in

the coverage which they offer. Some types, such as the log-periodic, give very broad coverage; others, such as a wire dipole, are more restricted in their bandwidth. While most antennas will operate to some degree outside their stated bandwidth, the performance is usually noticeably degraded there. Decide what coverage you consider most important and select your antenna accordingly.

You Get What You Pay For!

Don't rush out and order a coaxial antenna just because you hear it has a high gain. Likewise, don't be too eager to build that Yagi-Uda beam with its nice directional pattern unless you want to emphasize reception from particular directions or minimize reception from other directions.

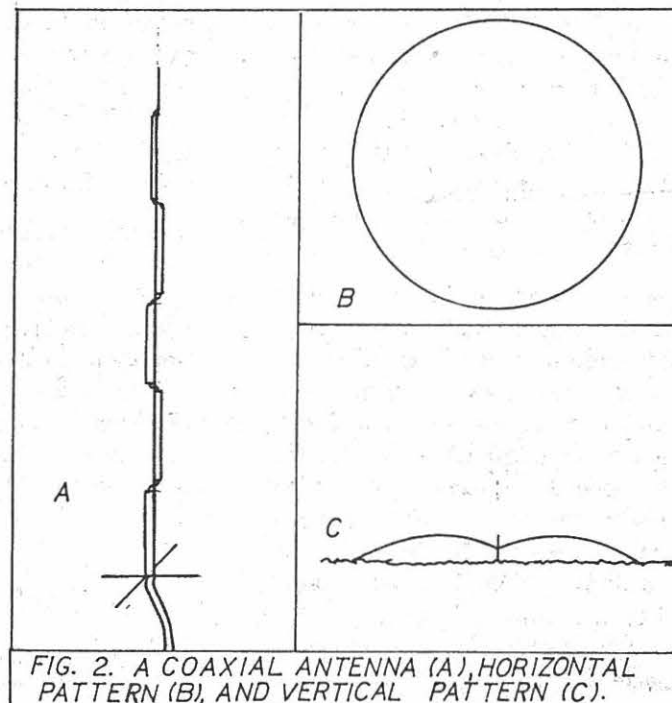
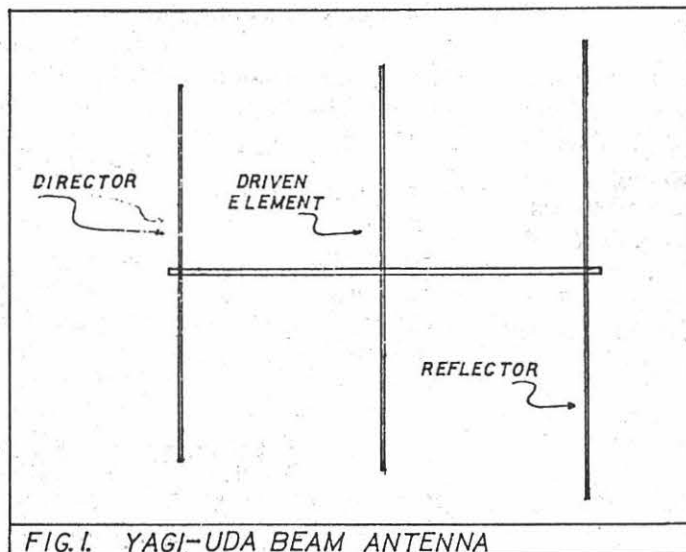
If you want to get the weak signals from a particular direction fine, get a beam; if you want to listen to all the local action on your scanner, the low gain, non-directional ground plane antenna may be just the thing for you. If you find that the farther-away locals are actually a bit weak on the signal strength, you may want a coaxial or other gain-type antenna with a non-directional pattern.

The rule we keep coming back to is: "Decide what you want your antenna to do, and then try to find the antenna type which comes closest to those requirements."

ABOUT OUR SMALLEST-AND-LARGEST ANTENNA CONTEST

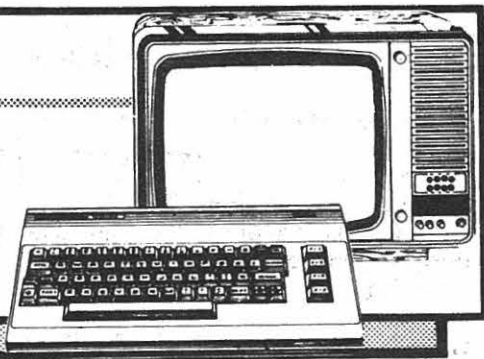
I want to extend a note of thanks to all of you readers who have been sending in entries for our "smallest and largest" antenna contest. As of this writing, the entries are still coming in. I'll be sorting them out soon, and the winners will be announced in next month's column.

The entries received so far have been very good; we'll cover some of the more interesting ones when we



MT Computer Corner

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MICROS IN SYNTHESIZERS

Last month we looked at the basics of a synthesizer based on a reference oscillator and a phase locked loop. There are other synthesizer schemes in user based on two crystal oscillators combined to give the desired output. Many of the CB rigs of the mid to late 70s used this scheme.

Crystal count was in the neighborhood of 12 to cover 23 frequencies. The crystal frequencies were selected so that many combinations of two crystals yielded valid CB frequencies; thus, one crystal being off frequency caused several channels in the rig to be wrong.

The PLL synthesizer not only cut the number of required crystals to one or two, but assured that as long as the reference crystal was of the correct frequency, all channels were also.

Let's finish last month's synthesizer...

How do we change the output of the PLL oscillator in order to allow

multi-channel operation? In last month's synthesizer, we had a $\div N$ block which divided by a nice round 100; this divided the 10 MHz VCO signal to 100 kHz for comparison to the 100 kHz reference output.

Suppose the $\div N$ block which divided by 100 was changed to divide by 99? The output of the $\div N$ block would then be about 101 kHz--101.010101 kHz, to be exact. When the phase detector compares this to the 100 kHz reference frequency, it will drive the VCO down in frequency by changing the error signal level.

The end result is that the VCO will be set to 9.900000000 MHz which the $\div N$ block will divide to 100 kHz, and the phase detector is satisfied that the reference frequency and the feedback frequency are the same.

If we change the division ratio to 98, the resultant VCO output becomes 9.8 MHz. At this point it should become apparent that the output

frequency is equal to the reference frequency multiplied by the $\div N$ block value, forming the basis of the channel-select feature of the synthesizer.

In a microprocessor-controlled rig, the $\div N$ block setting is a register whose contents are controlled by the micro. Operation is as simple as setting a front panel switch to the desired channel. The micro reads the new front panel switch setting and looks in a table for the $\div N$ block setting that corresponds to the desired channel frequency.

Design of a frequency synthesizer from the digital control standpoint is easy--just figure out the various division ratios for the desired frequency output in relation to the reference frequency. The hard part is finding a combination of the three that will yield all the channels desired.

The micro can also detect the pushing of the transmit button and thus know if the transceiver is transmitting or receiving. With the right

programming, the micro can change the value of the $\div N$ block to offset the frequency as desired for transmit or receive.

Loop response time is important--if the VCO is delivering a receive frequency and the transmit button is pushed, the processor will take several microseconds to change the divisor setting; additionally, the VCO must settle on the new frequency; there can be no transmission of the signal until after the VCO has stabilized.

The time required for the rig to stabilize depends on the actual division value, the amount of frequency change, filter constants in the error signal to VCO circuit, and on and on.

The foregoing should give you a feel for the workings and some of the design trade-offs of digital synthesizers. Now on to some goodies that turned up in this month's mailbag.

announce the winners. Watch for next month's issue and the names of the lucky contestants.

RADIO RIDDLES

Last Month: Last month I asked you a question about the well-known half wave dipole. I wanted you to consider just what is a "wave," and what is a "half wave?" And, if there is a wave, what is it that is waving?

Well, you probably know that a "wave" is a bit of radiated energy, sometimes called "electromagnetic radiation." As the transmitter producing this radiated energy goes from a neutral electrical starting state to a fully positive value, then back through the neutral state to a fully negative value, and back to the neutral state again, it produces one wavelength of signal. A radio signal is just this energy radiating out from an antenna with the continuously varying energy level as just described.

If we could freeze a beam of radio waves moving out from an antenna, and make those waves visible, we could see that they are all the same length. A "half wavelength" is simply half of one of these wavelengths, either the positive or the negative half. So, when we speak of a "halfwave antenna," we are speaking of an antenna which is just half as long as a wavelength as just

described above.

Now as to what is waving. We used to believe that the electromagnetic energy of a radio signal actually did wave something besides its own energy level. In the 1800s, and even into the 1900s, scientists and engineers believed in something called the "ether," a sort of all-pervading, invisible, intangible fluid which filled all space. However, this ether turned out to be so intangible that the scientific world gave up hope of finding it, and it is now out-of-fashion to believe in its existence. When a radio wave is transmitted, we now believe that all that is waving is the energy itself, varying in intensity as it wings its way to your receiving antenna.

This month: Most of us occasionally like to read a good mystery, and be thrilled by talk of ghosts, specters, and phantoms. But do such frightening creatures exist in the world of radio technology too? To learn the (spine tingling?) answer to that one, keep your dial tuned to *Monitoring Times*, as next month we discuss the answer to: "What is a phantom antenna?"

REFERENCE

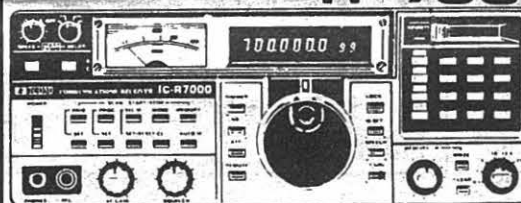
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D-810 50ch, 30-50, 88-108, 118-174, 406-512mhz...189.95
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Z-30 30ch, 30-50, 137-174, 406-512mhz...149.95
BEARCAT 40CHEN
BC-800XLT 40ch, 29-54, 118-174, 406-512, 806-912...319.95
BC-350 50ch, 30-50, 118-136, 421-512, AM/FM...299.95
BC-260 16ch, 30-50, 136-174, 406-512...219.95
BC-300 50ch, 30-50, 118-136, 421-512, AM/FM...269.95
BC-210XW 20ch, 30-50, 136-174, 406-512mhz...219.95
BC-100XL 16ch, 30-50, 118-174, 406-512, AM/FM...209.95
BC50XL 10ch, 29-54, 136-174, 406-512mhz...134.95
YAESU FRG-9600 60-905mhz, AM/FM/SSB/CW, 99 MEM...519.95
ICOM R-7000 99ch, 25-2,000mhz, FM/AM/SSB...949.95
FREE SHIPPING/INSURANCE TO 48...1986 CATALOG...\$1.00
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READER RESPONSE

At least one letter requested the full address of Greg McIntyre, who was mentioned in the Jan '87 column. Looking through the issue in question, we indeed did leave out the full mailing address. Thirty lashes for that one! OUCH! Here it is:

Greg McIntyre, Hillview Trailer Court, Lot 92, Belle Fourche, SD 57717. As mentioned before, Greg has a program for the C-64 that does schematic drawings, and is making it available at \$15.00.

Before we go into any more available software, let me say that the software offered by readers in most cases is untested by myself and, in such case, is a "buyer beware" situation. I have had no reports on any problems with any of the software I have mentioned in this column, so if you encounter any difficulties, drop me a note.

I feel that the readers of *MT* are only trying to share programs with fellow hobbyists, and the few dollars per disk asked in some cases is only to defray some of the out-of-pocket expenses for sharing. For example, I have been asking \$4.00 for any disks that I offer, and it breaks down like this: postage \$.78, diskette \$1.29, mailer \$1.00+, with the balance eaten up by tape, mailing labels, etc.

Jason Heindel (611 Crookes Ave., Kaukauna, WI 54130) sent me a copy of his program called "QSL Maker." Written in BASIC, it's for the C-64. I looked over the listing, and it is straight-forward and should be easily adaptable to any machine. Figure 1 is the listing as received.

For those of you who don't want to type it in, a \$5.00 check or money order to Jason will get you a disk full of programs for hams and astronomers.

Mark W. McCann WA8VNZ (9083 W. Wilson Road, Montrose, MI 48457) has a library of C-64 programs for frequency and logging, propagation and MUF calculations, etc. Drop Mark a line with an SASE, or send him a disk with a stamped return mailer, and let him know what your interests are.

Now that the goodies are taken care of, Mark Hureski of Redford, Michigan, tells me there is something called computer aided dispatch. Mark tells me that this system is widespread throughout the country, Federal Express trucks being one of the users. According to Mark, some police departments in his area have gone to this system, using Motorola KDT terminals.

Not surprising, as every so often there is a news clip about this or that organization implementing some new electronic gizmo that speeds up or makes possible more things in the area of communica-

```
READY.
30 PRINT"....."
40 PRINT"....."
50 PRINT"....."
60 PRINT"....."
70 PRINT"....."
80 PRINT"....."
90 PRINT"....."
100 PRINT"....."
110 PRINT"....."
120 INPUT"YOUR CALL":A$
130 IF A$="" THEN 120
140 INPUT"YOUR NAME":N$
150 IF N$="" THEN 140
160 INPUT"YOUR CITY & STATE (NO PUNCTUATION)":P$
170 IF P$="" THEN 160
180 INPUT"STATION WORKED":B$
190 IF B$="" THEN 180
200 INPUT"DATE (DAY/MONTH/YEAR)":D$
210 IF D$="" THEN 200
220 INPUT"UTC":F$
230 IF F$="" THEN 220
240 INPUT"FREQ":G$
250 IF G$="" THEN 240
260 INPUT"MODE":I$
270 IF I$="" THEN 260
300 INPUT"IS INFO CORRECT":T$
310 IF T$="" THEN 300
320 IF T$="Y" THEN 340
330 IF T$="N" THEN 120
340 OPEN 4:4
350 PRINT#4,""
360 PRINT#4,""
370 PRINT#4,"|", "SHORT WAVE RECEIVING STATION", "|", "I"
380 PRINT#4,"|", "A$", "N$", "P$", "B$", "D$", "F$", "G$", "I$", "T$", "I"
390 PRINT#4,"|", "A$", "N$", "P$", "B$", "D$", "F$", "G$", "I$", "T$", "I"
400 PRINT#4,"|", "A$", "N$", "P$", "B$", "D$", "F$", "G$", "I$", "T$", "I"
410 PRINT#4,"|", "A$", "N$", "P$", "B$", "D$", "F$", "G$", "I$", "T$", "I"
420 PRINT#4,"|", "A$", "N$", "P$", "B$", "D$", "F$", "G$", "I$", "T$", "I"
430 PRINT#4,"|", "A$", "N$", "P$", "B$", "D$", "F$", "G$", "I$", "T$", "I"
440 PRINT#4,"|", "A$", "N$", "P$", "B$", "D$", "F$", "G$", "I$", "T$", "I"
450 PRINT#4,"|", "A$", "N$", "P$", "B$", "D$", "F$", "G$", "I$", "T$", "I"
460 PRINT#4,"|", "A$", "N$", "P$", "B$", "D$", "F$", "G$", "I$", "T$", "I"
470 PRINT#4,"|", "A$", "N$", "P$", "B$", "D$", "F$", "G$", "I$", "T$", "I"
480 PRINT#4,"|", "A$", "N$", "P$", "B$", "D$", "F$", "G$", "I$", "T$", "I"
490 PRINT#4,"|", "A$", "N$", "P$", "B$", "D$", "F$", "G$", "I$", "T$", "I"
500 PRINT#4,"|", "A$", "N$", "P$", "B$", "D$", "F$", "G$", "I$", "T$", "I"
510 PRINT#4,"|", "A$", "N$", "P$", "B$", "D$", "F$", "G$", "I$", "T$", "I"
520 PRINT#4,"|", "A$", "N$", "P$", "B$", "D$", "F$", "G$", "I$", "T$", "I"
530 PRINT#4,"|", "A$", "N$", "P$", "B$", "D$", "F$", "G$", "I$", "T$", "I"
540 PRINT#4,"|", "A$", "N$", "P$", "B$", "D$", "F$", "G$", "I$", "T$", "I"
550 PRINT#4,"|", "A$", "N$", "P$", "B$", "D$", "F$", "G$", "I$", "T$", "I"
560 PRINT#4,"|", "A$", "N$", "P$", "B$", "D$", "F$", "G$", "I$", "T$", "I"
570 CLOSE 4:4
580 INPUT"ANOTHER CARD":Z$
590 IF Z$="Y" THEN 120
600 IF Z$="N" THEN NEW
```

Figure 1

tions. I read once where some law enforcement agency could transmit still pictures to mobile receivers to confirm the identity of an individual.

If you have any information on computer-aided dispatch, how it functions, operating frequencies and baud rates, etc., drop me a line. Better yet, write it up and send it to *MT*.

SKYLINE

Those of you active in astronomy and radio have probably heard the name Dave Rosenthal who produces a shortwave radio program, "Skyline," and is interested in bit-stream broadcasts. Radio Earth International via WHRI in Noblesville, Indiana, carries Dave's program on 7400 kHz Fridays 10 PM EST, rebroadcast on Tuesdays.

Dave sent me a long letter explaining his bit stream project. Basically, he has a computer connected to a tape recorder through a 300 baud modem and records the modem output while transferring a computer file to the modem. This audio signal would normally be connected via phone lines to another modem or, in some instances, by twisted pair wires. In normal opera-

tion the receiving modem would take the audio tones from the phone lines and convert them back to bit patterns for the computer.

Since Dave now has these audio tones representing the computer file on tape, he can now broadcast it via any radio transmitter. All that is required on the receiving end is a tape recorder to record the incoming audio. This audio is then replayed into a 300 baud modem and the audio converter back to bit patterns, just as if the audio were coming from a phone line. The end result is a copy of the original file on the second computer—all by radio.

One could feed the receiver audio directly into the modem at the receiving end, but there is only one chance to get the file into the computer error free. If a recorder is used, it can be retried at various levels until a good copy is obtained.

As I write this, Dave is planning two broadcasts, February 13, and March 6th. Unfortunately, by the time you read this, the broadcasts will be history. Such is life in the publishing world! I intend to write Dave and see if I can get more lead time on his next planned broadcasts to get the scheduled times in the

MT Ham Starts Listeners' Net

Congratulations to Mike Agnew KA3JJZ, for starting a monitoring network on the Baltimore, Maryland two meter amateur repeater (147.0 MHz). The net may be heard on any scanners Sunday evenings at 8 PM.

Ham Beacons Signal Propagation

Want to know when the skip is in the 20 meters, and from what part of the world? Listen in on a group of nine synchronized amateur radio automatic transmitting beacons on 14.10 MHz, identifying in Morse code throughout the hour.

The crystal controlled transmitter change power sequentially from 10 to 10, to 1, and finally to 0.1 watt during a one-minute period to allow listeners to determine propagation in that part of the globe. The service also allows switching between receivers and antennas to determine their relative effectiveness.

The following schedule indicates which transmitter occupies each time period and the sequence repeats continuously:

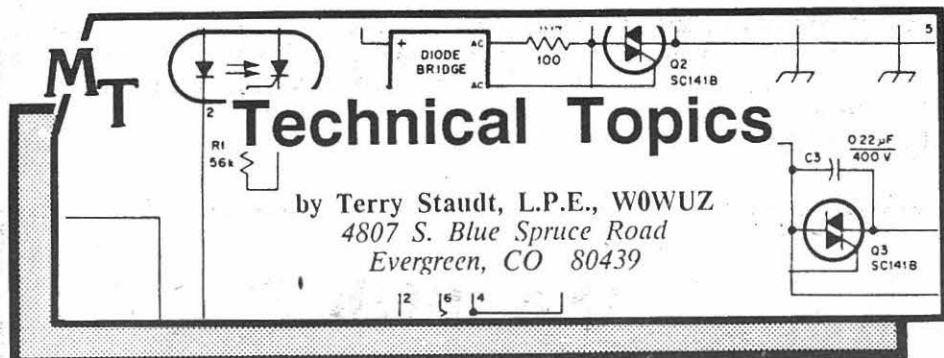
Minute	Call sign	Location
00	4U1UN/B	NY City
01	W6WX/B	California
02	KH6O/B	Honolulu
03	JA2IGY/B	Japan
04	4X6TU/B	Israel
05	OH2B	Finland
06	CT3B	Madeira Is.
07	ZS6DN	South Africa
08	LU4AA	Buenos Aires

(from the ARRL Newsletter)

column in time for reader participation.

Dave has an information sheet covering off-the-air data recording monitoring Jupiter's radio emissions etc. The sheet gives step by step instructions to set up a receiver and recorder for off air data reception. The information is free for an SASE. If you are interested in computer and radio transmission of data astronomy, etc., drop Dave a line: Skyline, P.O. Box 1502, Ridgecrest California 93555.

For those of you fortunate to own a Hayes Smartmodem 300, take a look in the back of the manual—you will find explicit directions on hooking your modem to the audio output of your receiver. It makes a low cost way of getting started in RTTY reception.



So you want to hear the cry of a dying fly?!

I Give Up: Jack It Up!

Despite on-going improvements of receivers over the years there are always "doubting Thomases" around that feel that there's a sinister plot afoot to keep them from hearing everything on the air. With the exception of the very cheapest sets that defy improvement, every radio may be enhanced--Isn't there a magic something that doesn't require adjustment to make that critical difference?

There is! *Use a resonant antenna!* Now that I've fulfilled my promise to mention this four times a year and you have kept your end of the bargain by not doing anything about it--here's what you all have begged for: an internal, "set and forget" shortwave preamp costing

less than \$20.00 that works perfectly.

If wired carefully this is an easily duplicated dream that requires only one initial adjustment and works with any internal power supply. This preamp is my design and I assure you it works as well as units costing \$75-\$100.00. All of the parts are Radio Shack with the exception of the transistor (and two resistors if you're using a transformerless-hot chassis--AC operated radio).

The current drain is negligible, less than adding another pilot lamp. All parts are attached to a Radio Shack "copper dotted perf board" for uniformity. Use #18 or #22 insulated wire for the cross connections. The board is attached to the receiver's internal antenna connec-

tion with those wires removed and attached to the preamp.

The circuit has only five resistors, five capacitors and five diodes--not too extreme after you study it with a cup or so of coffee (or whatever).

The Recipe (like fricken chickasee: "First you shake a ticken...")

You first need to obtain a 3N211 transistor from a jobber that carries RCA or Texas Instruments semiconductors--No Substitutes! This transistor can also be obtained from Fox Tango, P.O. Box 15944, W. Palm Beach, FL 33406 (about \$5.00 including shipping and handling).

At this point I have to say that if you can't do it, have a knowledgeable friend do it and take his family out for a nice dinner; this gem is worth it!

A few words about the components: When you select the ferrite pack, shake it to be sure it has at least one toroid (doughnut form) the size of a nickle or larger as well as a few ferrite beads which vary widely in content. For the L.E.D., you can go for a "bargain pack" or find one specifically marked "1.2-1.5 V." The infrared units fit the parameters but I personally like to see them flicker for piece of mind!

The PC board used is rather novel as it has two buss strips for

power and ground plus printed paths on the component side for easy parts placement. All in all, very nifty--I wish I'd thought of it!

Anyone that's built a Heathkit or similar project will have no trouble with this. With a minimal amount of prior experience, a decent soldering iron and "sheet to mechanical" acuity, the stuffing shouldn't take over an hour. Look at it very carefully before you solder, keep leads short and avoid unnecessary "cross-overs"; check it out for shorts and solder splashes.

Ready for Installation?

Unsolder the antenna and ground leads in the receiver and solder them to the toroid output winding (L2); solder the input antenna and ground connections from the preamp to the connectors just vacated and hook up the power lead.

With the variable pot, R1, set at wiper ground, attach a V.O.M. (AC volts) to the speaker. Connect RL (47 ohms) to the antenna connection on the receiver (see fig. 4). Now plug the AC cord back in and turn the unit on. Touch nothing!

With the receiver tuned to 3 MHz and the antenna peaked (if there is such a control on your radio), adjust the volume to exactly 1

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Center Freq 155 Mhz



2. 10 Mhz Wide

Center Freq 152.5 Mhz



3. 1 Mhz Wide

Photo #2 shows a group of frequencies between 152 & 153 Mhz and photo #3 shows the expanded view of this same group!

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717-386-4032

(TECHNICAL TOPICS, cont'd)

VAC on the meter; then adjust R1 on the PC board for just 1 dB increase (1.2 VAC).

That's it! The foregoing procedure sets the preamp without overloading problems from nearby transmitters. You also don't need any more noise than this.

If your receiver has only six volts available you will also need the voltage doubler capacitors and diodes shown in figure 3. In the event of NO power transformer you will require the two 3.3K, 2 Watt resistors as shown in figure 5--But first unplug the radio from the AC socket!

PARTS LIST (Radio Shack stock numbers)

Capacitors:

C1 4, .01 μ F #272-131

C5 470 μ F #272-1030

Resistors:

R1 25K mini PC pot #271-336

R2 47K 1/2 W #271-042

R3 1.2K 1/2 W #271-024

R4 3.3K 1/2 W #271-028

R5 100 ohm 1 W #271-152

RL (used only for initial adjustment)

47 ohms #271-009

Semiconductors:

D1 & 2: 1N914 or 4148 #276-1122

D3 1.2-1.5 Volt LED derived from #276-1622 "pak" or #276-143 IR LED

D4 1N4003 #276-1102

D5 1N4744 - 1 Watt, 15 Volt Zener. #276-564

Q1 3N211, high gain, low noise dual gate - static protected MOSFET

Transformers:

From #273-1601 inductor assortment

0.8-1.1 inch toroid core (doughnut)

Ferrite bead for the Gate 2 lead of Q1

Misc:

#276-150 Special multi-purpose PC board. Do not substitute unless you have experience as this piece makes the whole project very easy.

Wire. If you have none, #278-1295 or 278-1306 is recommended.

*To find a particular voltage of an LED (or Zener diode), all you need

is a 12 Volt small bench power supply, a 1K 1/2 Watt resistor and volt meter (VOM). See diagram (fig. 7).

"ASK BOB"

Bob Grove, WA4PYQ, answers questions of general interest

Q. How do receiver manufacturers decide on an IF bandwidth for different modes? (J.B., Euclid, OH)

A. Depending upon the modulation (voice, tone, music, etc.), different modes occupy different widths of spectrum: AM broadcast, 6 kHz; FM broadcast, 200 kHz; SSB, 2 kHz; narrowband FM, 16 kHz.

These are nominal values since transmitters vary in their specifications and filters vary in their design characteristics.

□ □ □ □ □

Q. I already have a Gilfer preselector on my Drake SPR4 receiver; will the Grove Power Ant and TUN3 MiniTuner provide additional improvement? (Marlin Field, Hillsdale, MI)

A. Will the Grove MiniTuner improve reception on my R71A receiver over my present Mizuho SX-3 preselector? (Jeff Bell, Riverdale, Western Australia)

A. No. You would merely be duplicating what you already have if you replaced them, and you would be adding more noise to the system to use them all at once. A better antenna is the answer, not more preamplification or preselection.

Many readers are disappointed in their shortwave reception at present, quite possibly the result of our being at the low ebb of the sunspot cycle. Cheer up; we're coming out of it!

□ □ □ □ □

Q. Is there a converter I can use either with my Sony ICF2010 or Bearcat 800XLT to hear the 225-400 MHz military aircraft band? (John Todd, Anchorage, AK)

A. At one time Grove Enterprises made a product called "Scanverter" which permitted reception of the 225-400 MHz range on any scanner with 118-136 MHz AM aircraft capability, or any shortwave radio. It was discontinued when the wide-frequency-coverage scanners emerged.

At the present time, I believe Hamtronics (65 Moul Rd., Hilton, NY 04468) is the only manufacturer of a converter for that frequency range. An SASE sent to that address should bring information.

□ □ □ □ □

Q. I have a portable shortwave radio. Can I attach an outside

antenna? Is there a difference reception when using batteries rather than AC power? (Nancy Kilkenny Parma, OH)

A. A longer antenna will always bring in stations stronger than the whip on the radio, but you can overload the set that way, causing interference from overly-strong stations. Check to see whether the radio is equipped with an external antenna jack, then order a tunable preselector from a reliable dealer. You will probably have to attach the appropriate plug since radios vary in their requirements.

Even if there is no jack, you can attach the new antenna system to the whip and to a metal screw (or even the earphone jack) on the radio for ground; this is necessary to provide correct tuning on the preselector.

Theoretically, there should be no difference in reception when using batteries or AC power; there are, however, some practical differences. Electrical line noise interference is more prevalent with the AC power (bad), but the ground return through the AC mains can enhance signal strengths (good). It's not your imagination--there really is a difference.

□ □ □ □ □

Q. I have a 1986 Pontiac Fiero with a plastic body; how can I hook up my CB? (A. L. Campbell, Gillett, PA)

A. You have a real problem. The negative lead (CB chassis) must be tied to the metal frame of the vehicle or to the battery directly. The positive lead must go to the main 12 volt line of the car, but not connected to the computer control system!. As with the negative lead, it may be better to go directly to the battery with the positive lead as well.

The antenna is the real problem; you have no ground plane mandatory for proper operation. You may try a bumper mount (if you can find some steel to attach it to), but you are likely to damage the body if you mount it to a fender or other body part.

The Fiero uses an in windshield antenna for the AM/FM radio; you may wish to use it also for your CB antenna as a last resort. If so, you will need a CB matching device such as the stock number 03GK9185X (\$11.95 plus shipping

"WOWUZ Ultimate Shortwave Preamp"

Fig. 1

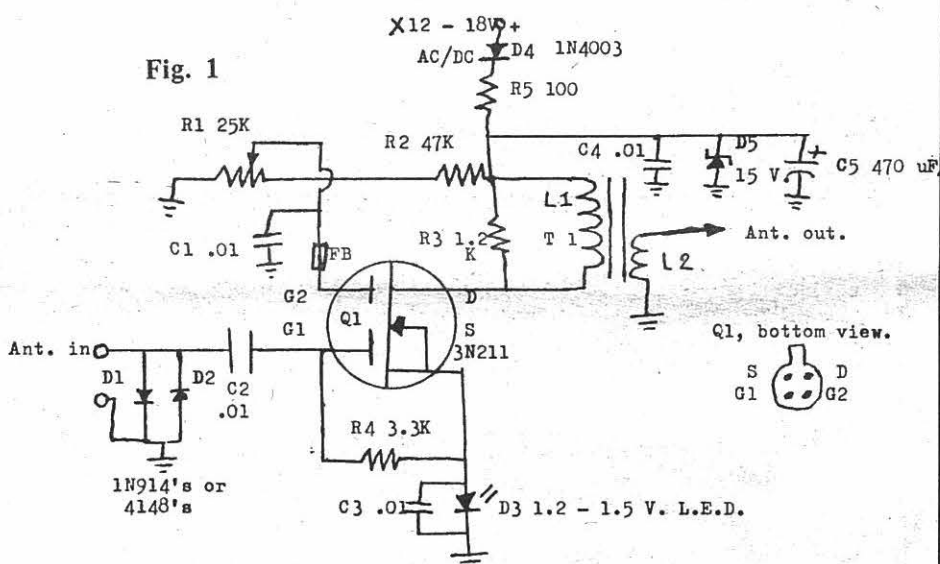


Fig. 2

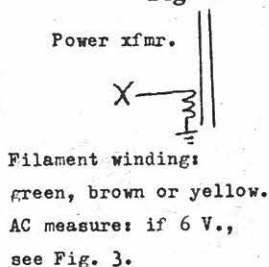


Fig. 3

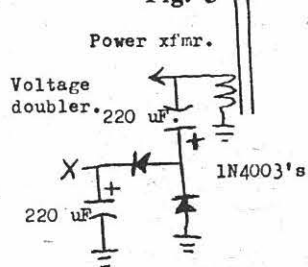


Fig. 4

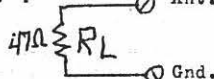


Fig. 6

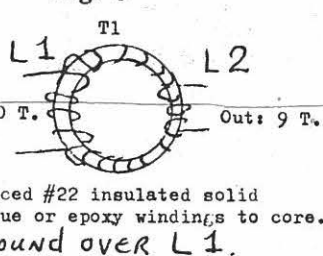


Fig. 5

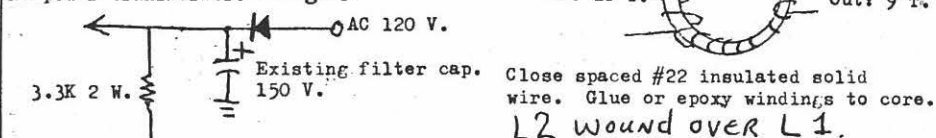
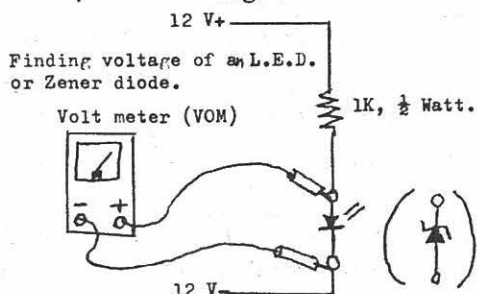


Fig. 7

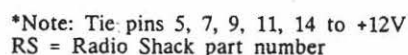


Larry Wiland

Two results of my modification should be noted: first, the "beep" will not be entirely defeated, but it will be so quieted that it will be nearly imperceptible; second, this mod will

3. Reassemble the scanner in reverse order of disassembly; the modification is complete.

Parts are readily available from Radio Shack and the circuit can be constructed on a printed circuit board, perf board or any other convenient layout, keeping lead lengths as short as possible.



Reader feedback doesn't go into the circular file--it's very important! Enjoy.

Diagram of a modified diode detector circuit. The circuit includes a transformer labeled "Last IF xfmr." with primary resistance R_1 (4.7K) and secondary resistance R_2 (68K). The secondary is connected to a diode bridge. One output of the bridge is connected to an "Existing diode" and then to a common output point. The other output of the bridge is connected to a network of resistors: R_3 (47K) and R_4 (10K) in parallel, followed by R_5 (1 MEG.) and R_6 (1 MEG.) in parallel. A capacitor C_3 (.05 μF) is connected to ground from the node between R_3/R_4 and R_5/R_6 . The common output point is also connected to a diode D_1 (1N34A) in series with a capacitor C_2 (.2 μF) to ground. A switch S_1 (SPST) is connected to the output of the diode bridge and the output of the diode D_1 . A 120K resistor is connected to ground from the output of the diode D_1 . The output of the circuit is connected to a common output point, which is also connected to a common output point labeled "Connected to remaining detector/audio".

Receiver/Scanner Auto-Record

And you thought you had it rough!

World's Worst RF Problem

by Mike Cooper

Have you ever wanted to own a giant receiving antenna the size of a football stadium to get that rare DX?

The British magazine *New Scientist* reports that builders of a new stadium in Saudi Arabia have inadvertently succeeded in constructing a massive antenna that is picking up so much RF from a nearby radio station that construction workers have seen sparks fly between cranes and girders, and riggers have been burned by the resulting electric arcs!

Fluorescent lights have been staying on, even when they are not connected to a power supply, flickering in rhythm with whatever is being broadcast by the local medium wave station, which operates with 1.2 megawatts of power on 585 kilohertz.

The Riyadh International Stadium where these happenings have occurred is a giant oval structure with a diameter of just under 1000 feet. Circling the rim of the stadium are 24 masts of steel tubing, each of them 200 feet tall, and twelve miles of steel wire hang from the masts. The magazine reports that this all combines to create 4 volts for each yard of metal work.

In an attempt to solve the problem, some British consultants were brought in. They rejected the idea of shielding the entire stadium with grounded wire mesh because of the

massive size of the structure, and the fact that it would make it difficult for massive crowds to enter and exit the facility.

Instead, concentric circles are being screened with galvanized steel mesh. Ventilation ducts are being grounded and wooden connectors are being used at frequent intervals. Water pipes are also being grounded and sections of rubber hoses are being installed.

Aluminum tape is being used to shield the wiring of the stadium's public address system and the wires that go to the electronic scoreboard. Previously, the scoreboard had been displaying garble because of the radio station RF.

Optical fibers are being installed to replace wiring for surveillance and broadcast cameras at the stadium, because engineers couldn't find a way to adequately shield the video wiring.

The engineers think they've solved the problems, but the nearby medium wave station has only been broadcasting at half of its normal power. No one knows for certain if the problems will recur when the station starts broadcasting at full power again, nor does anyone know what sort of DX possibilities have now been eliminated forever.

RIT for the Kenwood R-2000

by Gregory R. McIntire

All you need in order to change the tone control of the Kenwood R-2000 receiver into an R.I.T. (fine tuning) control is about three inches of insulated wire and a soldering iron.

First lay the radio upside down on a table and remove the bottom cover. Locate the tone control (VR2) and clip either lead of the adjacent capacitor (C1, connected to the tone control lug nearest to it).

Next, solder about three inches of small wire to the opposited lug of the control (not the center lug).

Locate transistor Q21 on the main (large) circuit board (it will be within reach of the three inch wire) and adjacent resistor R163 (100K).

Clip the exposed lead of R163 and solder the three inch wire to that resistor. You will need to scrape the paint from the lead of the resistor before soldering to it.

This mod simply puts the 10k tone control pot in series with R163 and provides a very stable R.I.T. control (variable BFO) with approximately 90 Hz tuning range, allowing infinite resolution of SSB, CW and ECSS signals.

If you have any questions about this simple modification please feel free to write to me at Hillview Tr. Crt. Lot 92, Belle Fourche, South Dakota 57717.

REFLECTIONS on radio

Out of the Past and into the Future:

THE FOOTHILL RADIO AND ELECTRONICS MUSEUM

by W. Clem Small, KR6A/1

The year was 1893; the place was the Chicago World's Fair. A lad of six stood fascinated as a man placed an odd-looking glass bulb in a display. This particular display was quite special: it was offering the modern electric light for all the world to see.

Noticing the young boy's interest, the man turned and gave him one of the burned out bulbs saying, "Young man, get your hands on some of these and save them. They will have valuable historical significance some day." (1)

The man was George Westinghouse, the boy was Douglas M. Perham, who would later become a pioneer in radio and electronics himself, and the bulb was the first item in the boy's electronics and radio memorabilia collection.

Now, close to 100 years later, Douglas Perham's extensive collection of early radio and electronics items forms the nucleus of the Foothill Electronics Museum, one of the best collections of its kind in the world. The museum, located in Los Altos Hills, California, houses extensive exhibits of historical and contemporary significance from the fields of radio and electronics.

Outside the Walls:

A visitor, upon approaching the entrance of the museum, encounters what appears to be a steel casting about 4-1/2 feet tall, more reminiscent of a miniature space ship than anything we would recognize as a radio transmitter today. That "casting" is a 30-kilowatt arc transmitter made by the Federal

Telegraph Company in the early days of radio.

These arc transmitters were quite inefficient and required massive construction as well as water cooling in order to handle the heat produced in the process of generating their radio frequency signals.

One old-time radio operator, 6FR, writing in his book, *56 Years of Wireless*, gives an idea of the considerable weight of even a relatively small 5-kilowatt Federal arc transmitter (2). Just such a transmitter installed in a ship's radio station broke free of its mounting in rough weather and literally threatened to bash a hole in the vessel before it was finally secured and remounted!

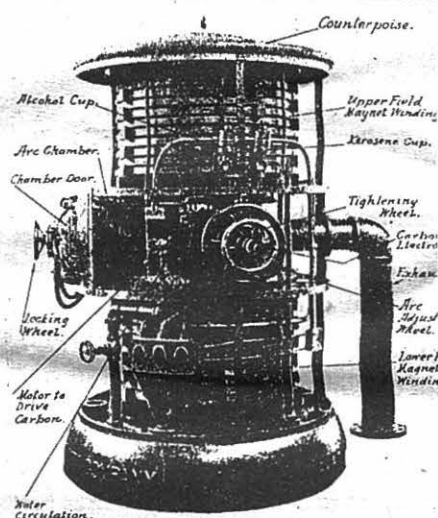


Fig. 1. A 100 kW Federal arc converter, similar to the one at Foothill, with its casing removed (3)



Fig. 2. Display of early tube-type radios at Foothill Museum

Perhaps the massive construction of these transmitters is the reason that the Museum's 30-kilowatt behemoth greets the arriving visitor from outside the building rather than inside!

Let's Take a Tour:

On display inside are examples of receivers, transmitters and associated equipment from the days of spark transmitters and coherers. Only slightly more recent are the exhibits of arc transmitters, crystal sets, Fleming valves, and DeForest's early triodes. Then come the more sophisticated vacuum tubes such as kysstrons, magnetrons and early television tubes. Detailed histories of the development of some of these tubes and other devices are also displayed.

On display as well are more contemporary achievements such as the development of the transistor, the integrated circuit and the modern computer technology. Although many of these discoveries are the work of Californians, the museum has displays of the work of inventors across the U.S. and around the world.

The museum library houses much material of historical significance, including the personal library and papers of Dr. Lee DeForest, the father of modern electronics.

All This, and "Hands-on," Too!:

Numerous displays offering hands-on demonstrations of basic electrical phenomena await visitors who can explore to their heart's content in the world of high-voltage electric sparks, rectifiers, vacuum tubes, and many other aspects of radio and electronic circuits.

Moving on, the visitor will find such interesting items as receivers and transmitters manufactured by the Marconi Company, founded by Guglielmo Marconi himself. The Marconi transmitters are of the induction-coil with spark gap variety, so common in Marconi's day.

Receivers in this display utilize

either the magnetic detector, the crystal detector, or the less sensitive and less reliable coherer with which Marconi initiated wireless communications. These earlier detectors, in turn, yielded to the DeForest audion which is also to be found on display in the museum.

Other early-day radio developments such as the regenerative detector, neutrodyne receivers, early superheterodyne receivers, and a collection of broadcast receivers bridge the years from the earliest days of broadcasting to the present.

Pioneer Broadcasting...

On full public view, complete and intact, is pioneer broadcasting station "FN," or "San Jose Calling." This was the first radio station in the United States to make regularly scheduled broadcasts. FN, through a series of call sign and location changes, is now radio station KCBS in San Francisco.

...and Even Ham Radio

The equipment of early amateur radio station "6CL" is preserved complete with its log and QSL cards! And, of course, there is a modern amateur radio station on the premises for use on special occasions.

Included in the expansive collection are mementos of inventors like Farnsworth, the father of all-electronic television; early X-ray and fluoroscope devices; early vacuum tubes and vacuum capacitors; and even a computer-controlled robot with cutaway views of its working interior systems.

In addition to the displays and the library, the museum also provides meeting space for two amateur radio clubs, a science club, a computer club, a rocket club, and various radio and electronics-related classes for Foothill Junior College (on whose grounds the museum stands)!

Don't Miss It!

This museum is dedicated to all those who have been active in radio,

science and electronics, as well as in preserving for posterity the rich heritage of radio and electronics' proud past. If you plan a trip to the San Francisco Bay area, be sure to plan a visit to this museum; it will be a high point of your trip. ■

References:

1. Foothill Electronics Museum of the Perham Foundation. Foothill Electronics Museum, Los Altos Hills, CA, (undated)
2. George, *56 Years of Wireless by George*, 3rd ed. Self-published,

no location given, 1963.

3. Signal Corps, U.S. Army, *The Principles Underlying Radio Communication*. Washington, Government Printing Office, 1921, pg. 409.

NOTE: If you have radio or electronic items of historical interest or value which you would like to have preserved by Foothill Museum, contact Foothill Electronics Museum of the Perham Foundation, 12345 El Monte Rd., Los Altos Hills, CA 94022. Phone: 415-8590, ext. 381.

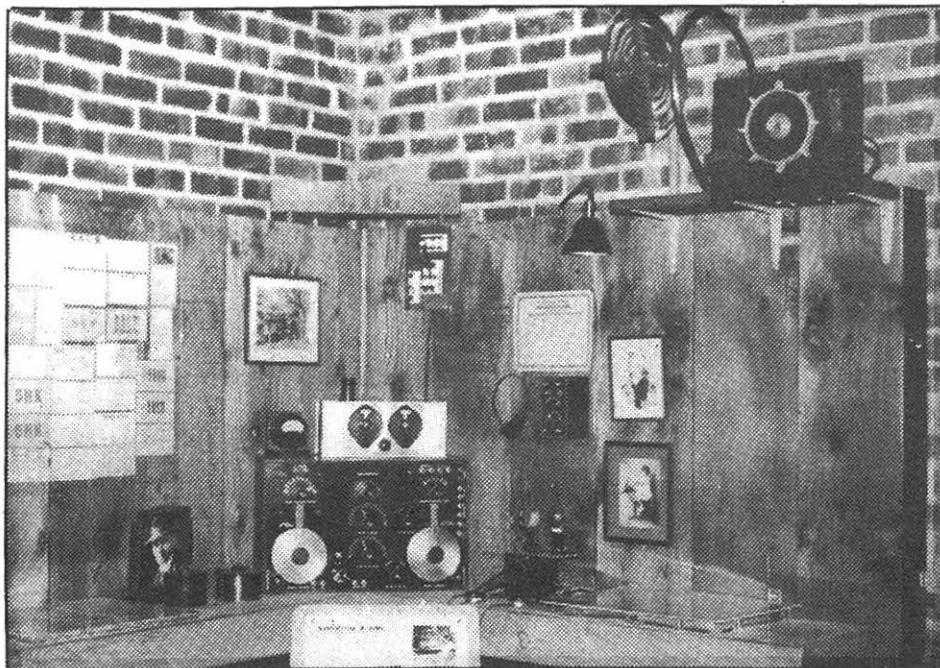


Fig. 4. Early amateur "spark" station 6CL is on display.

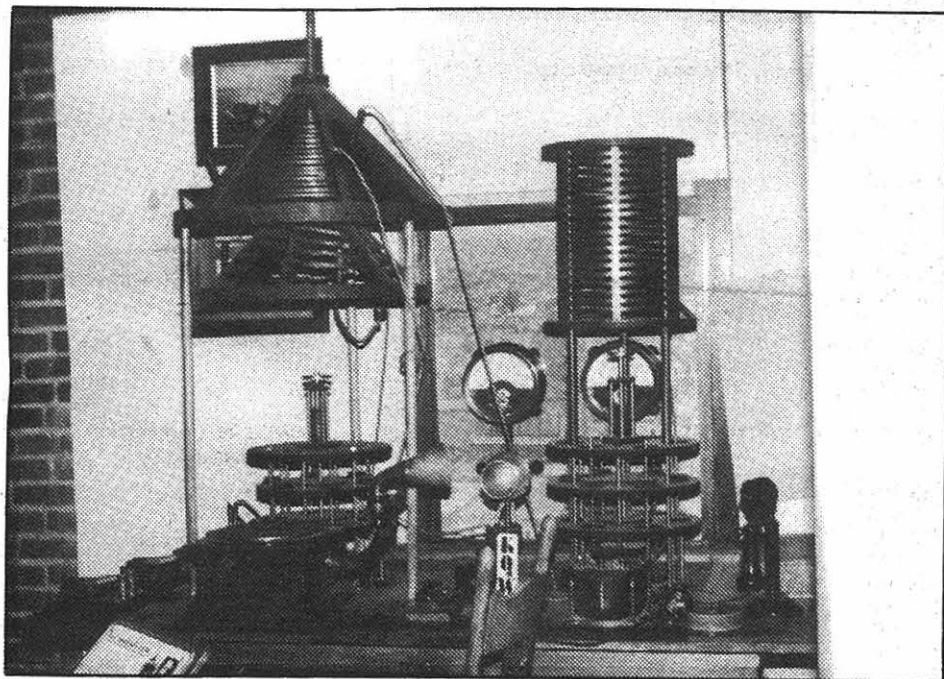


Fig. 3. "San Jose Calling!" This was the first radio station to give regularly scheduled broadcasts.

How Much Are You Missing?



World Radio Report

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Shortwave radio brings you your world. And that's a lot of ground for any magazine to cover. It's also why most magazines just don't measure up. It takes a full-time staff to dig up the information you need -- not volunteers who only sit down at their radios after a hard day's work at the office. Shortwave radio is all we do -- nothing more, nothing less. And precious few other shortwave magazines can say that. While you're at work, we're at work, so that when you do have time to listen to your radio, you'll know everything you need to know to get the most out of your radio.

If you're serious about your shortwave, you owe it to yourself -- and your radio -- to check out a full-time shortwave magazine. One year of World Radio Report is just \$18.00. Sample copies are just \$2.50 in the U.S.; \$3.50 elsewhere in the world. Send check, money order or cash to World Press International Inc., 3 Lisa Drive, Thorndale, PA 19372. From the publishers of International Radio.

**Station News * DX Tips * Advance
Program Details * Frequencies *
Equipment News * Articles * and More**

(LISTENERS' LOG from p.35)

45.220	Madera
155.580	Fresno Ch.1
154.650	Fresno Ch.2
155.655	Fresno Ch.3
154.875	Fresno Ch.4
460.125	San Joaquin
460.350	San Joaquin
460.125	Kings
460.075	Kings
155.070	Alameda
155.250	Alameda
155.190	Contra Costa
155.310	Contra Costa
155.040	Contra Costa
155.640	Contra Costa Danville
156.210	Santa Clara
156.150	Santa Clara
156.700	Santa Clara
154.875	Santa Clara
482.3375	Santa Clara
155.565	Santa Cruz
155.955	Alameda
154.650	Alameda
155.070	Alameda
155.130	Alameda
155.250	Alameda
158.850	Alameda
453.750	Alameda
489.1375	Alameda
155.75	Stanislaus

FIRE DEPARTMENTS

153.770	Stanislaus Co. Dispatch
154.430	Stanislaus Co. Ch.2
154.130	San Joaquin Co.
154.070	San Joaquin Co.
154.400	Merced Co. Dispatch
154.340	Merced Co. Ch.2
154.445	Mid Valley Dispatch
154.340	Mid Valley Ch.2
154.130	City of Merced Dispatch
154.175	City of Merced Fireground
154.310	City of Fresno Ch.1
153.845	City of Fresno Ch.2
154.190	City of Turlock
155.940	City of Modesto Ch.1
154.145	City of Modesto Ch.2
153.950	City of Manteca
154.070	City of Madera
460.600	Kings Co.
460.600	City of Stockton Dispatch
460.575	City of Stockton Ch.2
154.235	Alameda Co. Firegrounds East
154.070	Alameda Co. Firegrounds West
33.920	Alameda Co. Dispatch
154.310	City of Tracy
154.340	Solano Co.

LOCAL GOVERNMENT

154.995	Stanislaus Co. road crews
155.115	Stanislaus Co. Agriculture Dept.
155.775	Stanislaus Co. Animal Control
45.080	Tuolumne Co. road crews
45.920	Tuolumne Co. Schools
155.295	Tuolumne Co. Schools
462.620	San Joaquin Co. Air Pollution
453.700	Stockton Animal Control
155.920	Stockton DPW
153.920	Newman, Ceres, Oakdale
155.235	Merced City Schools
453.275	Fresno City Buses
153.785	Livingston
153.875	San Benito Co.
453.225	Stockton Metro Transit
458.225	Stockton Metro Transit
453.550	Modesto DPW
453.275	Turlock DPW
153.965	Ceres DPW
452.675	Modesto City Buses
155.175	Waterford School Buses
154.025	Sacramento Reclamation Dist.
154.025	Stockton
153.995	Mariposa Sheriff, road crews, school buses

MED NET

Med Net 1	463.000
Med Net 2	463.025
Med Net 3	463.050

Med Net 4	463.075
Med Net 5	463.100
Med Net 6	463.125
Med Net 7	463.150
Med Net 8	462.175
Med Net 9	462.950
Med Net 10	462.975

MEDICAL SERVICES

155.385	Stanislaus Co. Med Net
155.235	Doctor's Hospital
154.385	Contra Costa EMS
46.3200	Contra Costa EMA
155.220	Memorial Hospital
154.320	Sonora EMS
155.400	San Joaquin Co. Med Net
155.295	Tuolumne Co. Med Net
154.515	Sonora Ambulance Dispatch
155.220	Doctor's Ambulance Dispatch
155.295	Modesto/Ceres Ambulance Dispatch
155.160	Patterson Ambulance Dispatch
155.220	Turlock Ambulance Dispatch
155.295	Waterford Ambulance Dispatch

UTILITIES

158.205	Stockton PG&E
153.605	Tracy PG&E
153.605	Fresno PG&E
153.560	Merced PG&E
153.560	Mariposa PG&E
153.470	Gustine PG&E
153.680	Modesto Irrigation District
48.0150	Turlock Irrigation District
47.9200	Merced Irrigation District
153.440	Santa Paula PG&E
158.130	Modesto PG&E
451.300	Pacific Telephone Co. Modesto
451.200	Del Este Water Company Modesto
158.235	Sonora PG&E

RAILROADS

160.650	Santa Fe Road Chan.
161.370	Santa Fe Yard Chan. Stockton
161.385	Santa Fe Yard Chan. Fresno
161.010	Santa Fe Maintenance
160.590	Sierra Railroad
160.305	Central California Traction
161.325	Modesto & Empire Traction
161.550	Southern Pacific Road Chan.
160.890	Southern Pacific Police
160.740	Union Pacific
160.380	Western Pacific Road Chan.
160.260	Western Pacific Road Chan.
160.515	Tidewater Southern
453.975	BART Yard
453.150	BART Police
160.860	BART Road Chan.

CALIFORNIA HIGHWAY PATROL

COLOR	BASE	MOBILE
Gold	42.120	42.200
Purple	42.400	42.160
Blue	42.340	42.180
Green	42.540	42.180
Silver	42.080	42.280
Red	42.440	42.280
Yellow	42.520	42.300
Black	42.460	42.700
Gray	42.480	42.680
Brown	42.500	42.820
Tan	42.420	42.840
White	42.560	42.720
Orange	42.880	42.660
Copper	42.600	42.740
42.880	CHP Merced base dispatch	
42.660	CHP Merced mobile	
42.520	CHP Stockton Dispatch, Modesto area	
42.300	CHP Stockton mobile	
42.340	CHP Stockton	
42.460	CHP Stockton	
42.560	Stockton dispatch	
42.720	CHP Stockton mobile	
42.440	CHP Fresno dispatch I-5 West side of valley	
42.080	CHP Fresno dispatch	
42.280	CHP Fresno mobile both freqs	
42.340	CHP secondary blue	
42.120	CHP Oakland and Sacramento dispatch	
42.520	CHP Tracy	
154.905	CHP Extender system	

STATE PARKS-FISH AND GAME-WATER RESOURCES

44.640	State Parks Ch. 1
44.680	State Parks Ch. 2
44.720	State Parks Ch. 3
44.800	State Parks Ch. 4
44.880	State Parks Ch. 5
151.430	Fish & Game Ch. 1
151.415	Fish & Game Ch. 2
159.420	
159.435	
151.205	Water Resources Ch. 1
151.235	Water Resources Ch. 2

CAL DEPT OF FORESTRY

151.175	Tuolumne-Calaveras Ranger Unit
151.460	Madera-Mariposa Ranger Unit
151.260	Region Net 4
151.440	Region Net 5 Morgan Hill
151.250	Monterey-San Benito Ranger Unit
151.370	San Mateo-Santa Cruz Ranger Unit
151.325	San Luis Obispo Ranger Unit
151.340	Lake-Colusa Ranger Unit
151.385	Fresno-Kings Ranger Unit
151.190	Tulare Ranger Unit
151.355	State Net
151.310	Yellow Air used in Mariposa-Madera Unit
151.295	Green Air used in Santa Clara Unit
151.280	Blue Air used in Tuolumne-Calaveras Unit
151.220	Handie Talkie
151.400	Santa Clara Ranger Unit
122.925	Plane to plane communications

OFF. OF EMERGENCY SERVICES

153.755	Ch.3 Administration
153.775	Ch.5 Administration
153.830	Ch.4 Administration
154.160	Ch.1 Fire
154.220	Ch.2 Fire
154.265	Ch.2 White Net
154.280	Ch.1 White Net
154.295	Ch.2 White Net

CALTRANS

47.020	Dist.4 San Francisco
47.020	Dist.7 Los Angeles
47.040	Dist.9 Bishop
47.040	Dist.3 I-80 portables
47.040	Dist.4 portables
47.060	Dist.4 San Francisco
47.080	Statewide construction
47.100	Dist.2 Redding
47.100	Dist.10 Stockton
47.120	Dist.7 Los Angeles
47.160	Dist.3 Marysville
47.160	Dist.8 San Bernardino
47.180	Dist.5 San Luis Obispo
47.200	Dist.1 Eureka
47.200	Dist.6 Fresno
47.240	Dist.7 Secondary limited use

BRIDGES

Antioch	453.850
Carquinez	453.850
Dumbarton	453.850
Vincent Thomas	453.900
Richmond-	
San Rafael	453.900
Coronado	453.900
San Francisco-	
Oakland	453.850
San Mateo	453.850

NATIONAL FOREST

168.750	Stanislaus Main
166.585	North Zone Net
166.625	North Zone Air Net
168.625	Forest Net
168.200	Crew Net
170.000	Ground to Air
171.475	Stanislaus Fire Camp Net
172.225	Forest Net
171.400	Sierra Main
171.475	Forest Net #3 Sierra
169.875	Forest Net #4 Sierra
164.125	Fire Camp Net Sierra
169.200	Air Tac #3 Sierra

ERRATA

In our January 1987 "Technical Topics" column, two goofs (both obvious, fortunately!) need correcting. The trimmer capacitors in figure 3 ("Chop it Cheap") are 5-60 p (Radio Shack #272-1340); the voltage ratings of the capacitors mentioned in the "Correction" box should be 250 volts; these capacitors will be found in figure 3B of our November, 1986 column.

Voices on the Milsats

Many owners of the new breed of programmable scanners containing the 225-400 MHz band are aware that there are military satellite communications downlinks to be heard in the 240-270 MHz portion of that swath of spectrum. But 3 megahertz is a wide swath to search in hopes of tripping over a brief voice transmission.

Most voice communications via milsat are narrowband FM, not AM as found in the remainder of the 225-400 MHz air-to-ground military aeronautical band. A few milsat voice relays may even be single sideband. Most communications, both voice and data, are encrypted.

In the United States, one particularly productive frequency range to tune in between 261 and 264 MHz; here many clear voice channels are often reported, often routine phone patches from military bases around the world to stateside receiving sites.

168.150	Forest Net #3
171.500	Fire Camp Net
169.150	Air Tac #2
172.650	Yosemite National Park
171.800	Yosemite National Park

U.S. Army Corps of Engineers

163.412	Ch. 1
163.437	Ch. 2
163.435	Delta Levees
163.410	Delta Levees
163.425	

Dept of Interior
Bureau of Land Management

166.375	New Melones
166.375	Ch. 1
166.487	Ch. 2
167.000	Ch. 3
166.325	Bureau of Reclamation

U.S. Coast Guard

157.100	Notice to Mariners
171.3125	Intelligence
171.3375	Intelligence

NEXT MONTH: More Central California scanning frequencies contributed by LaVerne Visser of Stockton. Leave room in your frequency list to combine them both!

(WORLD RADIO NEWS from p. 5)

French station identification at 0958 UTC. Still holding up well by 1030 recheck. Note that this one always IDs as RTV de Mali, not RTV Malienne. (Bob Hill, Sharon, MA)

Mauritius

Mauritius Broadcasting Corporation (tentative). Undoubtedly this one on 4856 with audio from 1940 UTC. Could be discerned as choral selections, man and woman announcer in what sounded like French. At 2004, male soloist singing until transmitter suddenly cut off at 2006 and did not return. (Bob Hill, Sharon, MA)

Morocco

RTV Morocaine at 1609 UTC on 17595 kHz in Arabic. International newscast and Arabic music. Station sign off at 1700 UTC. (J. Swail, Philadelphia, PA)

Mozambique

A printed schedule received from Radio Mozambique shows English at 1100 UTC on 9825, 11820 and 11835 kHz. English is also reportedly on 1800-1830, (extended to 1900 UTC on Wednesday, Friday and Sunday) 3265, 4855 and 9620 kHz. (RCI SWLD)

Netherlands

Radio Netherlands is planning a special documentary commemorating the dual 40th anniversary of Radio Netherlands (60 years) and foundation that operates it (40 years). The proposed air date of the program is April 20.

New Zealand

The New Zealand-based Radio Rhema Network (which already operates 2XL on 801 kHz, 3XG and 2XG, both on 1503 kHz) announced that they intend to start a broadcasting facility somewhere in the Pacific. Plans include a shortwave transmitter operating on the Tropical Bands.

Paraguay

Juan Carlos Codina in Switzerland reports a Paraguayan shortwave station reactivated after many years: Radio Internacional Incarnacion 11940.57 kHz heard January 12 from 2000 past 0130 UTC. For the news it's parallel Radio Nacional, Asuncion on 9735 kHz. (RCI SWLD)

Philippines

Radio Veritas Asia has inaugurated a new 250 kW transmitter. According to Cardinal Joseph Hoeffner, the new unit will show the commitment of the Catholic church to man's eternal salvation and well-being on earth. The schedule for the new transmitters is now:

0000-0100 on 11820, 15255
0100-0200 on 11755, 15130
1230-1430 on 9585
1430-1600 on 9710, 15120 (DSWCI)

Peru

The government has reportedly shut down the unlicensed La Voz de Cutervo (6551 kHz) and an MRTA clandestine station, Radio Quatro de Noviembre, also on shortwave. (RCI SWLD)

Portugal

Radio Renascenca, the short-wave station of the Portuguese Catholic church, (Sundays 0945 to 1230 UTC on 9575 kHz, Saturday and Sundays 1400 to 1800 UTC on 9680 kHz, daily 1800-2000 on 9680 kHz and daily from 0015 to 0130 on 9600 kHz; all in Portuguese) is in a battle with the government to retain a network of FM stations it has owned since October, 1985. A new broadcasting bill approved in late December withdraws the station's authorization to operate on the FM band. Portuguese bishops are denouncing the action as "a grave injustice." (BBCMS)

Spain

Radio Exterior de Espana, also known as Spanish Foreign Radio, broadcasts in English on the following schedule:

0000-0100	6125, 9630 (Americas)
0500-0600	6125, 9630 (Americas)
1830-1930	6020, 7275, 9765, 11820, 15375 kHz (Europe/Middle East/Africa)
2300-0000	6020, 7275 (Europe)

Interestingly, Spanish Foreign Radio also offers a broadcast in Ladino for Sephardic Jews on Thursdays from 1830-1900 UTC on 21575 kHz.

Sweden

Radio Sweden International is now using 9695 kHz instead of 15345 kHz for its 1400-1430 UTC transmission to North America. (Bob Shrader, Austin, Texas) [It might be in addition to 15345 kHz - ed.]

The full schedule of English transmissions is:

0230-0300	7275, 11950 USB (Australia/Asia)
0330-0400	11705 (Middle East)
0930-1000	9565, 15390 (Asia/Australia)
1100-1130	6065, 9630, 15245 (Europe/Middle East/Africa)
1230-1300	7175, 11735 (Asia)
1400-1430	9695, 15345 (Americas)
1600-1630	6065, 9660 (Europe/Africa/Asia)
1830-1900	6065, 9605, 9715 (Europe/Middle East/Africa)
2100-2130	6065, 9700 (Europe/Africa)
2300-2330	6045, 9695 (Europe/Americas) (BBCMS)

Tanzania

Radio Tanzania in English at 0400 UTC on 9684 kHz. Very weak

international newscast. Jammer on the frequency. (Larry Van Horn, Orange Park, FL)

Turks and Caicos Islands

Atlantic Radio Beacon, a new station on 1570 kHz. Heard at 0555 UTC with sign off announcement. Signed on November 12 with 50,000 watts and is owned by Turks and Caicos Beacon, Ltd. in California. Current schedule is 1000 to 0600 UTC daily. Station personnel have indicated that they might be considering a short-wave outlet on the island. (Larry Van Horn, Orange Park, FL)

United States of America

Radio Netherlands' Media Network program talked to officials at WCSN, the proposed station of the Christian Science Monitor and was told that they planned to sign on the air in middle to late February. Look for test transmissions now. As for their other station in Saipan, the official said

that it wouldn't be going on the air as a CSM station right away. "We're still deciding exactly what programming to put on KYOI and how soon and whether we need to have it all in Japanese [the original target for KYOI's rock music was Japan] or exactly what the programming content will be." [See interview with the Christian Science Monitor's Russ Gerber in *World Radio Report* for an update.]

The Voice of America has again re-timed its unpublicized afternoon Caribbean report in English to 2200-2215 on 9640, 11740 and 15120 kHz. This follows the expansion of the Haitian-Creole program, which is also secret, until 2200 UTC. (RCI SWLD)

World Radio News is provided to Monitoring Times as a public service by World Radio Report magazine. Sample copies of WRR are available for \$2.50 in North America, \$3.50 elsewhere in the world. Subscriptions are \$18.00 in North America, \$26.00 elsewhere in the world for 12 issues from Miller Publishing, 3 Lisa Drive, Thorndale, PA 19372-1034 USA. Copyright 1987 the Foundation for International Broadcasting, Inc. All rights reserved.

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Bob Grove, Utilities Editor, P.O. Box 98, Brasstown, NC 28902

SONY 2010 GOING SOFT

By this time, Bob, I am sure you have recovered from your night session on the Ray Briem Show. You did an excellent job and I wish to commend you on your enunciation and pronunciation; it was perfect. What a pleasure to listen to a dissertation that is delivered clean and sharp.

It was noted that several participants phoned to complain about their Sony 2010. One in particular from New Jersey wanted to find out how he could get some volume out of the audio on his set. He had no results with an outside antenna.

It was necessary for me to return my 2010 to you about a week ago for the same reason. Is there any way to get Sony to improve their quality control? This sort of thing is bad for their image, your business, and the customer's confidence.

Verlin Shinn
Hidden Hills, CA

Thank you for your kind words! Yes, 3 AM is pretty early to get up on a Saturday morning, even if it is to be heard nationwide!

While I personally check out every piece of gear (including the Sonys) that leaves here for our customers, some do occasionally slip by with a defect that went unnoticed. I am now checking all ICF 2010s for good shortwave response...Bob

IN DEFENSE OF THE PRESS

Concerning the January 1987 *Monitoring Times* story entitled "Shultz Manipulates Press 'Leaks,'" I think some response is due.

The game plan for the balance of power between the government and the press was outlined by cooler heads some 200 years ago this year. Apparently, over the last few years, the press has gotten better at gathering information than the government has at hiding it. Mr. Shultz's comments and the entire article fall into the category of "sour-grapes."

Please remember that the law that allows members of the press to gather and print information is the same as the one that allows your readers to listen to the airwaves and more importantly, allows you to help them out by publishing where to listen.

It isn't we in the press who should apologize for the way we do our job, it should be the government. It isn't our fault that the press is

playing like the METS while the government looks like the 57th Street "Y" sandlot team. If they didn't leak, we couldn't print! And believe me, there is a lot printed that is there because someone in government wants it to be.

Rick Moran, WA2BBG
Photo Assoc. News Service Inc.
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LET'S COMPARE RELIABILITY

I have a suggestion that might be of benefit to *MT* subscribers. How about a repair record analysis of some of the receivers versus production year, like *Consumer Report* does for cars. Model/ Year/ Electrical/ Mechanical/ Component, etc.

I own a Kenwood TS-430S and in 4-1/2 years, have replaced (myself) two switching transistors, one crystal, one S meter pot, and one RF choke! With more components in the advanced receivers, the probability of failure goes up quickly. If I didn't have an electrical engineering degree, my repair bill would have been pretty heavy! What kind of reliability have other *MT* readers found?

Woody Peitzer, AK2F
Randolph, NJ

Interesting concept and I really wish there were a way that such a "consumer's guide" could be accurately composed. Unfortunately, I doubt that it would be possible. For example, my experience with the Kenwood TS430S after four years' use has been quite good, with no replacement parts necessary. This experience led me to replace it with the newer and more flexible TS440S...Bob

THE HAM COLUMN

I really enjoy *MT* greatly and look forward to its arrival each month. Since you joined with Larry Miller, I have found *MT* to be even more interesting. I would like to add my two cents worth on the issue of inclusion of Ham Radio in *Monitoring Times*.

Since ham related publications have items of interest to the SWLer, why should the SWL community want to try and keep anything ham radio oriented out of such publications as *Monitoring Times*? Most hams started out as SWL's and are usually more than willing to help out an SWL with an antenna problem if only the SWL will take the time to seek out and ask one or two of the

local hams the questions they have on their mind.

I say that publications such as *MT* should leave the door open for hams to take an active part, and if that means including a single column or two to ham related materials, so be it, we all stand to gain from it.

John Henault,
KA1OXZ-KDX1SWL
Abington, Massachusetts

A TARNISHED KNIGHT

The editorial in the January issue of *MT* has inspired this letter; I am referring to "A Tarnished Knight"--the "Captain Midnight" episode.

What John MacDougall did was probably wrong! But, more importantly, what he did was to focus national attention on the price and tactics of cable TV and their unfair and unreasonable attitudes towards TVRO owners.

Now, no one believes that TVRO people want totally free programming, and yet that seems to be a common thought. "You used to get it free and now you are mad and want to steal it," or words to that effect. Nothing could be further from the truth as regards the majority of TVRO owners.

Naturally, there are "free-loaders" in every crowd; our crowd has them much to the dismay of the vast majority. But in no way do these often loud and noisy people represent all of us.

I will confess to a certain sympathy with Captain Midnight. I can certainly understand his frustration and the way he feels about the unfair way that the industry is being squelched by the cable industry. Captain Midnight's plight has simply been a reflection of the plight of many of us, especially those of us in the business, such as dealers of equipment like myself.

So, regardless of what he did, the good "Captain" has gotten himself into a "folk hero" situation. I couldn't care less if he makes some money out of the whole thing! More power to him, regardless of what his original motives were, or are now, for that matter! I should be so lucky!

Chuck Boehnke
Keaau, Hawaii

REASON TO WORRY

In regard to the article "The FBI and FOIA" in *MT* for January 1987, it seems noteworthy to me that the FBI representatives are described as saying, in regard to a hypothetical recipient of mail from communist countries, that "...an investigation without just cause... would be a violation of his civil rights."

Note that this doesn't actually say that no such investigation would be undertaken, only that it would be a violation of civil rights: something that has never deterred the present administration (or, to be fair, most of its predecessors) for a moment.

Even allowing for my native

paranoia, I've had enough experience of break-ins where radios, cameras and money lying out in the open weren't stolen, but papers were gone through and photographic negatives handled. In this specific event, the intruder was careless enough to leave fingerprints on the picture areas of the film. In the past I've offered 8x glossies of the fingerprints to anyone with resources to trace them, on condition that the identity of the owner be published -- Enough experience to have my doubts of any assurances.

Dale Neuburg
Laurel, MD

CASHING THE CHEQUE

I am looking forward to continuing my subscription to *Monitoring Times*. As a Canadian however, I find it odd that you should request that we send in the subscription by money order rather than on a cheque.

Will you perhaps give me a word of explanation as to why you find this necessary? I know there must be some good reason but I find it a terrible inconvenience to have to run to the post office blocks and blocks away to get a postal money order.

R.M. Zahoruk, M.D.,
F.R.C.S.(C)
Hamilton, ONT

We are assessed ten dollars by our bank for every check drawn on a Canadian (or other foreign) bank!...Bob

A SCANNING SCHEDULE?

There are many events that go on during the year that can be monitored on HF or VHF or UHF frequencies. Since you know more about what is going on in this area and many times know the frequencies that will be used, could you publish the up-coming activities and frequencies, say, a few months ahead of time?

Tony Orelike
E. Pittsburgh, PA

Excellent suggestion, Tony. How about it, readers?...and writers?...Bob

INFORMATION, PLEASE

I am a race fan nut, Cart and USAC fan the most part. I like to take my scanner to the big races--Indianapolis, Michigan and couple of others. I wonder if any reader could supply me with a list of frequency use by the various teams, tracks TV people or any other groups that would be interesting to listen to at a track.

An issue or so ago someone suggested that they would like to start a club of people that owned a Sony 2010; I would be interested in joining a 2010 fan club, would also be interested in obtaining more information on the operation of the 71A. William J. Quigley, 826 Illinois Ave., Ottawa, IL 6131

I enjoy general scanner monitoring. I live in the Kansas City, MO, area and have been looking for any kind of radio monitoring club in the area. I have written many of the large clubs advertised in the various publications, but no luck with any contacts in my area. I am writing to you, hoping that you assist me in finding other hobbyists in the area, or maybe a club.

Mailbag

Broadcasting

Larry Miller, MT Broadcast Editor, P.O. Box 691, Thorndale, PA 19372

It's time once again to overturn the sack of mail that's been accumulating here in Thorndale and see what we've got.

Envelope, please.

QSLing SOUTH AMERICA

The first letter comes from Nicholas Peter Adams of Newark, New Jersey. He says he finds *Monitoring Times* "fantastic -- a complete magazine for those of us interested in radio in all its aspects." Nick's been AM DXing since grade school and shortwave DXing since 1960. "Right now I'm into Central and South American DXing and it is so sad that many of the major nations in that part of the world have no English broadcasting at all. Fortunately, I speak Portuguese fairly well and can get by with Cuban Spanish somewhat."

"But how about helping me out with some addresses for the stations

I've heard? Here's my list."

O.K. Nicholas, hit me.

Radio Nacional de Paraguay:

Try writing to Oliva Alberdi, 6 to Piso M.O.P.C., Asuncion

Radio Nacional de Chile:

Casilla 244, Santiago

Radio Nacional de Venezuela:

Apartado 3979, Caracas

Ecos del Torbes: Apartado 152, San Cristobal, Venezuela

As for your final question about whether to try to send the reports in English, I suggest, since you know some Spanish, you use that.

RADIO ACTIVITY

Reuben Dagold, publisher of the club Association of DX Reporters, writes to thank us for featuring their bulletin in the December *MT*. "For your information," he adds, "and not to appear as an ingrate, our utility column, which you neglected to excerpt from, is the best club utility column around today!" Reuben adds a P.S. "You and Bob are putting out a fine publication. Keep up the good work."

Well, thanks Reuben. It was real nice to hear from you. If anyone wants to check out "the best club utility column around today," why not write for a sample copy. I don't have a price list in front of me, but if you slipped Reuben a buck or two, I'm sure he'd get a sample in the mail to you. The address is 7008 Plymouth Road, Baltimore, Maryland 21208.

Unfortunately, we're not having too much luck with the rest of the ANARC clubs. As of this date, not one club has sent us a bulletin for the purpose of showcasing in "Radio-activity." And that's really ironic because while we're offering a full page of free publicity for the clubs, they're constantly moaning about how club membership is dropping. And they wonder why.

Bob and I have discussed this problem and we'll try to keep helping the clubs in this way, but if we don't get any cooperation, there is no question. We'll have no choice but to close the column and do something else. It's sad but true.

CANADIAN CHALLENGER

J.S. MacKay of Vancouver sends in a little profile of a station he's hearing -- a local to him but a real DX challenge to those of us on the east coast. The station is CKZU.

"The station," says J.S., "is an outlet for the Canadian Broadcasting System but is not connected with Radio Canada International. Rather," he continues, "they broadcast domestic material originally on the local high-power CBC AM outlet. The shortwave has a modest 1 kilowatt transmitter and a horizontal antenna which is somewhat directional. Programming is continuous from 6:00 AM to 1:00 AM PST; 1400 to 0900 UTC."

Thanks for the information, Mr. MacKay. If you're ever in the area and feel like doing some creative writing and perhaps take a few pictures, we're always looking for articles. Let me know.

PROPAGATION PROFILE

Francis Jacobs of Youngstown, Ohio, checks in with some comments on *Monitoring Times*, short and sweet. "I think," he says, "you've come a long way since the first *Program Guide* and I look forward to reading *Monitoring Times* every month."

Francis, who uses a Uniden 2021 receiver with a 60 foot antenna, also wonders if we might put in a propagation report -- "something in a lay person's language as to where the low starts to enter the high."

I think that Bert Huneault has the right idea with "Propagation Report." Of course, that forecast is primarily (see p.30, December *Monitoring Times*) for points domestic, such as "between Detroit and Miami." Maybe we can get him to make up one of those charts for us shortwave listeners.

MONITORED FREQUENCIES

A gentleman who prefers to remain anonymous writes to say that "I think many of your readers are confused by the listings in your frequency section. At the introduction it says 'All frequencies in this list have been heard by one or more *MT* Monitors during the previous month.'"

"However, on page 56 it says that to expect all the listings to be audible is a mistake made by 'people new to the hobby.' I have been listening to the radio every day for the past sixty years (with the exception of the two years I spent in a Nazi concentration camp). In my opinion, many of the frequencies you list have not been heard in North America for a lot longer than the past couple of months."

"It looks to me like you are taking your information from published schedules and only augmenting it with actual monitoring. Why not admit this? Or better yet, only report what's actually been heard?"

You are, in part, right, but only because of a small typographical error. The phrase you mention should read "All frequencies in bold in this list have been heard by one or more *MT* monitors during the previous month." But the fact is that

most of the information -- by far the greatest majority -- does come from actual monitoring. We're fortunate to have on our team not only a number of exceptionally skilled DXers but an active readership that also passes on what they've been hearing. I might also point out that simply because a frequency is not in bold does not mean it cannot be heard.

A lot of this stuff is really -- and I emphasize *really* -- difficult to hear. So don't be discouraged. It's out there. And we're constantly monitoring, listening to DX programs for frequency changes and new stations, and in general, keeping well on top of things.

I might take a moment to pat our monitors on the back and say that doing the frequency section is a massive and difficult job -- made worse by the fact that at least four times a year the stations begin a bizarre rite of musical frequencies. At such times, say, March, we have to make educated guesses at where stations are going to be when you get your magazine in April. As you might guess, there is a delay of a few weeks between the time that the monitoring is completed and the magazine reaches your mailbox. During those times we must rely on predictive data from past seasons. All in all, the *MT* team does one hell of a job under some very trying circumstances.

NDXE LAMPOON

Finally, a complaint from Mr. Norman Monro of Gadsen, Alabama, addressed to Bob Grove. "In all the years I've been reading *Monitoring Times*, I recall no instance of 'putting the other fellow down.' But now that you've taken up with Mr. Miller, we have twice been treated to his musings on what he considers to be a joke, namely Mr. H. Dickson Norman's Radio NDXE."

"If Miller is going to report on Norman's real or imagined shortcomings, he might well show a bit of tact and do some investigating and interviewing before lowering the axe."

Mr. Monro. Look carefully. I have not been writing things about NDXE Global Radio. I've only been quoting some of the most respected media journalists in the world, many of whom do quite clearly doubt the promise of "Global Stereo Radio." After all, you must remember, he was the man who first announced his proposed station by saying he was going to beam the audio from U.S. TV soap operas to Europe. Joke, never. This man is serious.

And with that letter, we now end our global mailbag for this month. By the way, did I ever tell you that we were thinking of doing this column in stereo? And if you'd like to join our mailbag listener's club, just send \$36.00 to.... See you in the funny papers.

group that you might know of that might help. Any help would truly be appreciated. Michael Bucko, 17306 S. 49th Ct., Independence, MO 64055

(Can anyone help Mike?)...Bob

Wanted: service information for the following--Heathkit frequency counter #IB1103, Function Generator #IT2250. B&K regulated D.C. supply #1601 and Radio Shack digital meter #22-198. Please state price or use fee. Mike Adams N4EVS, 6333 Hiway 2321, Deer Point, Panama City, FL 32404.

Needed: For college electronics course, Heathkit Design Experimenter #ET-3100 or similar. Please give description and state price. Sylvia Free, 7906 Shorebluff Ct., Tampa, FL 33637

Would like to see plans, schematics, kits, and literature on building radio pager/beepers. Also any "How To" information on starting a paging (common carrier, etc) business. Contact: Joe. T. Magnano, 12Cone Road, East Hampton, CT 06424 (203) 267-4355.

Wanted: Shortwave and scanner file programs (on tape) or that I can put on tape for a Radio Shack Color Computer 2 (16K Extended Basic). Mike Day KOH8HE, 273 Willaston Dr., Dayton, OH 45431

Homebrew scanner frequency lists for Quincy, IL/Hannibal, MO, Battle Creek, MI, Toledo, OH, Watertown, NY. Very accurate and up-to-date. SASE to: Kevin Trickey, 312 Jackson, Delta, OH 43515-1505.

Wanted: Manual and/or schematic for a Realistic DX-300. Will pay \$5 and your postage. Gerald Buccilli, 21583 Poinciana, Southfield, MI 48034.

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WANTED TO BUY: Radio not too expensive that would pick up all aircraft, space shuttle, and most satellites; also airforce and weather air stations. Gene Perryman, Box 1104 R-2, Kendrick, Idaho 83537.

Collins military surplus cache, R-390 receivers and like equipment, parts, manuals. 35 East Pond Road, Narragansett, RI 02282; 401-783-7106

Wanted: ZENITH Transoceanic - solid state - in good working condition.
For Sale: PANASONIC RF3100 shortwave receiver 31 band/AC/Battery. Little used-1 year warranty left, \$195.00. H. Herp, 6615 Michele Ct., Huntington, MD 20639; 301-855-7071.

For Sale: INFO-TECH M-600 multi-mode code receiver with M-600 ROM. Manual and original boxes; this unit will print FDM; \$500.00. Dave Hills, KA8AFN, 1505 E. Second St., Port Clinton, Ohio; 419-734-2366.

Wanted: Good working PANASONIC RF1600 or similar radio with same coverage. Jim Bagge, 110 Gralia Drive, Springfield, MA 01128; 413-783-3172.

HAL CT2100 RTTY/CW/Morse send and receive communications terminal with keyboard and video output, many, many features; \$250.00. Clif Brown, 336 Ashland, Evanston, IL 60202; 328-5204.

FIREMEN - Want to trade even stephen. Have an old cork British fire helmet, or an antique small iron Gamewell fire alarm street box. Both good cond. Will swap either for good program aircraft scanner. Or both for Regency Z60, HX2200, or something like that. A.C. Hall Jr., 305 N. Main St., Wake Forest, NC 27587. Or call (919) 556-5745.

For Sale: BEARCAT DX-1000 shortwave receiver, new, in mint condition and original box. Cost \$399.00, Sell for \$265.00. TOSHIBA F-11 portable \$65.00; BULOVA World Time Clock \$20.00; TELOCK World Time Clock \$15.00. Will ship free. Mel Ragucci, 1430 Saturn St., Merritt Island, FL 32904-4706.

Wanted: ICOM 551 6-meter transceiver. WB8HWF, 1575 Ditmore-Stroll, Newark, OH 43055.

ATARI P/D software for ham, SWL, and etc. For sale or trade. SASE for details. Jerry Callam, 10 Avalon Rd., Mount Vernon, OH 43050.

JOIN a radio listening club. Complete information on major North American clubs and sample newsletter \$1.00. Association of North American Radio Clubs, P.O. Box 462, Northfield, MN 55057.

Wanted: YAESU FRG9600 - SONY ICF-2010 - YAESU FT-23R. Sell/trade KENWOOD TH-41AT + access. Larry Taylor, 3602 Geminia #1A, San Angelo, TX 76903; 945-653-0544.

For Sale: PANASONIC RF-B600 mid-size digital portable receiver. 150kHz - 30MHz + FM, LSB & USB A-1 condition with original carton & manual. \$250 incl. shipping by UPS. David S. Kendall, 1610 Fruit St., Huntington, IN 46750; 219-356-5096 after 6PM EST.

Trade: TRS80 Model 1, two expander units, three disc drives, monitor, cables for anything radio or electric trains. Bill Smith, RFD 238W3, Locust St., Douglas, MA 01516.

Wanted: Would some Florida scanner listener please send me a list of the SIGNAL and CODE numbers used by most Florida police; Note--not the 10 code. T. Dietrich, 4527 N. 100 St., Milwaukee, WI 53225.

Pick up sale. COLLINS 51S-1, R390, 13.8V power supply, Bearcat 300. Sy Kramer, 318 N. Chancero, Green Valley, AZ 85614.

For Sale: DATON Multi-Mode F/2 filter with power supply. \$100.00. Joe Balitza, RR #2, Box 90-1, Palmerton, PA 18071.

For Sale: Sony ICF-2010, mint condition, original carton, all accessories, three months old, \$220, includes UPS. Steve Ziegler 207-767-2862.

Homebrew projects. List - SASE - WB2EUF, Box 708, East Hampton, NY 11937.

FOX GREAT LAKES DIRECTORIES - \$8.95 plus \$2.00 shipping. While supply lasts. Heald, 1905 Johnson Mill Rd., North Branch, MI 48461.

For Sale: REGENCY MX 4000 scanner \$125.00. DYMEK DZ-1000 active antenna \$100.00. John Zidanich 716-693-5290.

Wanted: HRO 500 H.F. receiver in good condition. Contact: Jim Dolan at P.O. Box 51161, Seattle, WA 98115 or 206-524-0827.

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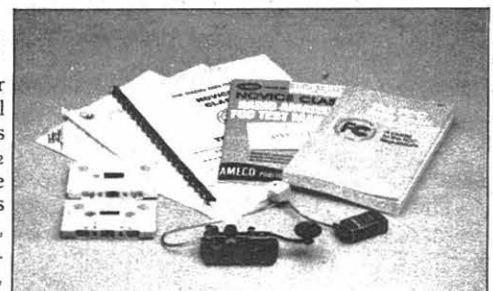
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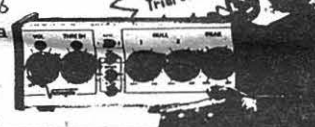
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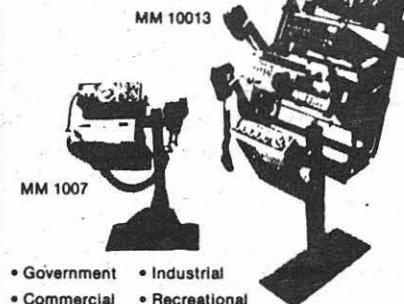
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The R7000 covers aircraft, marine, business, ham (amateur radio), emergency services, government and television bands—all for a remarkably low price. For simplified operation, this receiver offers direct keyboard entry. Precise frequencies can be selected by pushing the digit keys in sequence of the frequency. The frequency will be automatically entered without changing the main tuning knob.

Memory channels may be called up by pressing the Memory switch, then keying in the memory channel number from 1 to 99. All memories are backed up by a lithium battery.

But the features don't stop here. Optional accessories include the RC-12 remote controller, a voice synthesizer to announce frequency settings, and even a serial interface for external computer control!



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